

R&S® BBA150

Broadband Amplifier

Excellent amplifiers from
9 kHz to 6 GHz with high
power density



R&S®BBA150

Broadband Amplifier

At a glance

The R&S®BBA150 broadband amplifier family generates power in the frequency range from 9 kHz to 6 GHz. The compact amplifiers are rugged and feature high availability. They are ideal for amplitude, frequency, phase and pulse modulation. Extensive switching options for input, output and sample ports are available for different applications.

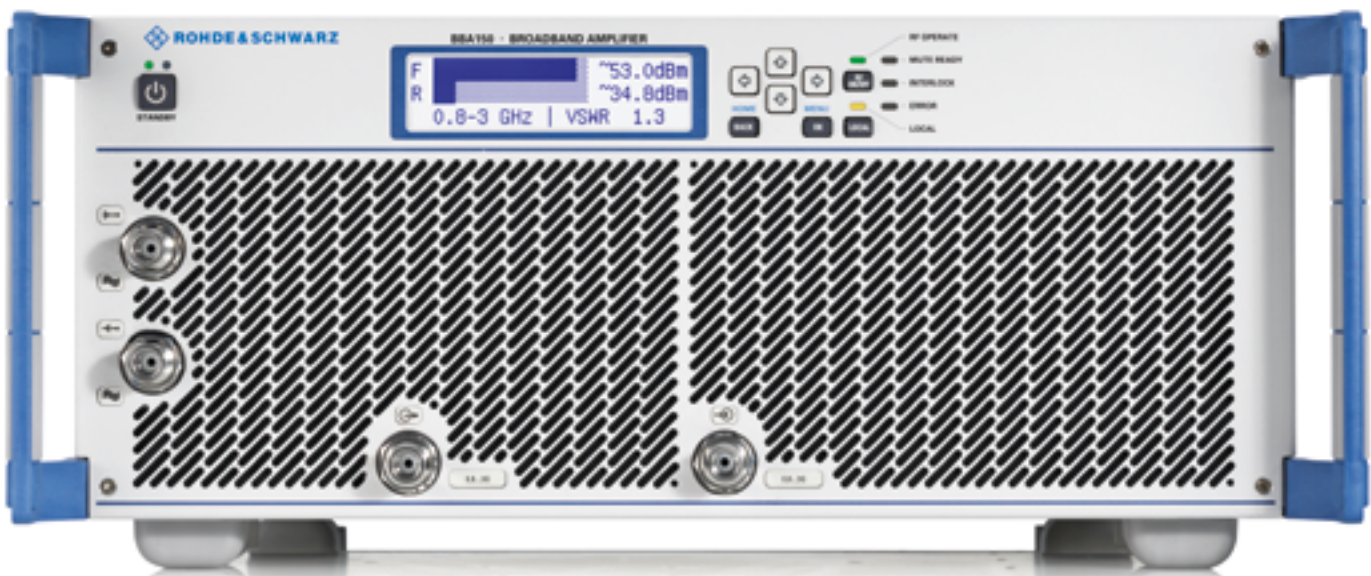
The R&S®BBA150 broadband amplifiers cover a total of four frequency bands: 9 kHz to 250 MHz, 80 MHz to 1 GHz, 0.8 GHz to 3 GHz and 2.5 GHz to 6 GHz. They can be used to address a variety of applications, including the various standards for EMS measurements up to 6 GHz. In the industry environment, the R&S®BBA150 broadband amplifiers are suitable for development and product validation tests in quality assurance and in the development and production of components. Other fields of use include research, physical engineering and communications.

The R&S®BBA150 broadband amplifiers are based on a modular, lightweight design that is optimized for the required frequency band. They are available in two versions. The low-power amplifier comes as a 4 HU 19" rack-mount that can be used as a desktop model or installed in a rack. Devices with higher power must be installed in racks. The amplifiers are operated either using display and buttons, or via remote control interface (automated operation) or via a web browser.

The modular concept is a prerequisite for upgrading power and frequency range later on. The worldwide service concept and the global availability of spare parts promote the trust and confidence of customers.

Key facts

- Frequency bands: 9 kHz to 250 MHz, 80 MHz to 1.0 GHz, 0.8 GHz to 3.0 GHz, 2.5 GHz to 6.0 GHz
- Output power from 15 W to 1000 W
- 100% mismatch tolerance
- Suitable for amplitude, frequency, phase and pulse modulation
- Three-year warranty and worldwide spare parts availability



R&S®BBA150

Broadband Amplifier

Benefits and key features

One of the most advanced broadband amplifiers on the market

- Sophisticated RF design
- Compact and lightweight
- Series production in one of Europe's most progressive plants

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Reliable with high availability

- Outstanding expertise in amplifier development
- Cost benefit due to low downtime

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Flexible control and operation

- Manual operation
- Local and remote operation via web browser and PC
- Integration into the R&S®EMC32 EMC measurement software
- Remote control via Ethernet
- Safety thanks to two different interlocks

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All in one device

- Compact design and modular structure
- Extensive switching options for inputs, outputs and sample ports

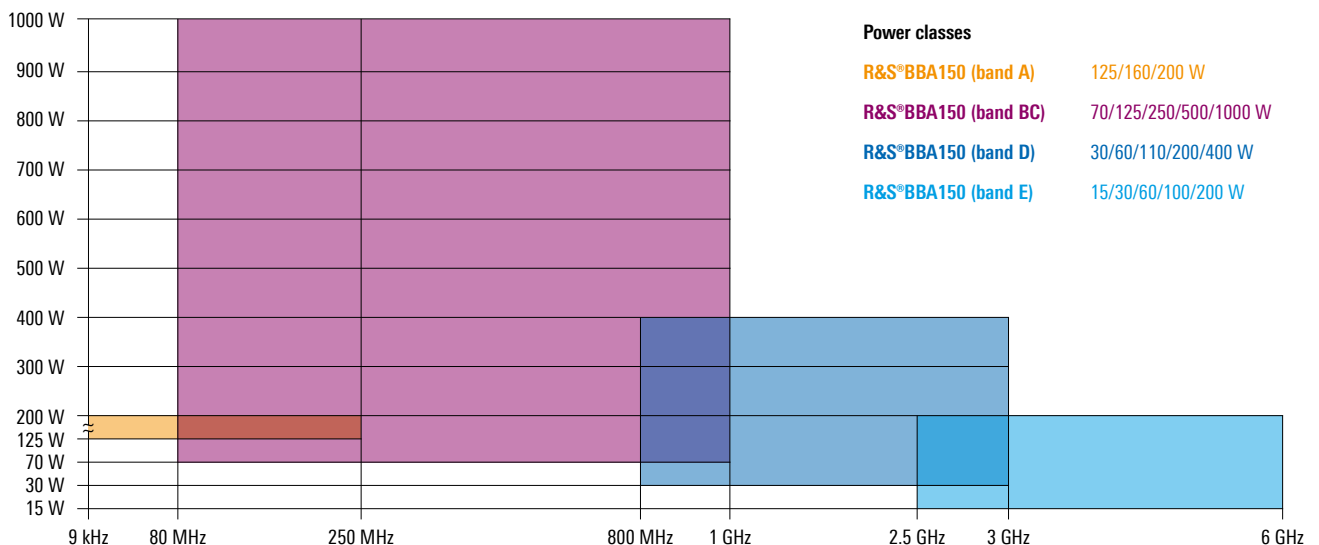
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Excellent service and quick maintenance

- Outstanding service concept
- Extended warranty for maximum protection of investment
- From pre-sale to service – at your doorstep

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Model overview



One of the most advanced broadband amplifiers on the market

Outstanding RF design in combination with high-quality series production in one of Europe's most progressive plants

Sophisticated RF design

State-of-the-art design and simulation programs used during development, the use of power semiconductors from internationally leading manufacturers and the decades of experience of the Rohde&Schwarz engineers in developing amplifiers produce the most advanced amplifier design currently available. In the frequency band from 2.5 GHz to 6 GHz, semiconductor dice directly bonded onto printed boards make it possible to achieve high output power. As a result, parasitic effects caused by housed transistors are avoided.

Efficiency coupled with ruggedness ensures smooth operation. Lean firmware with effective monitoring and protection mechanisms provides operational safety. Generous dimensioning of the RF amplifier stages provides sufficient margin and ensures compliance with warranted data sheet parameters.

Compact and lightweight

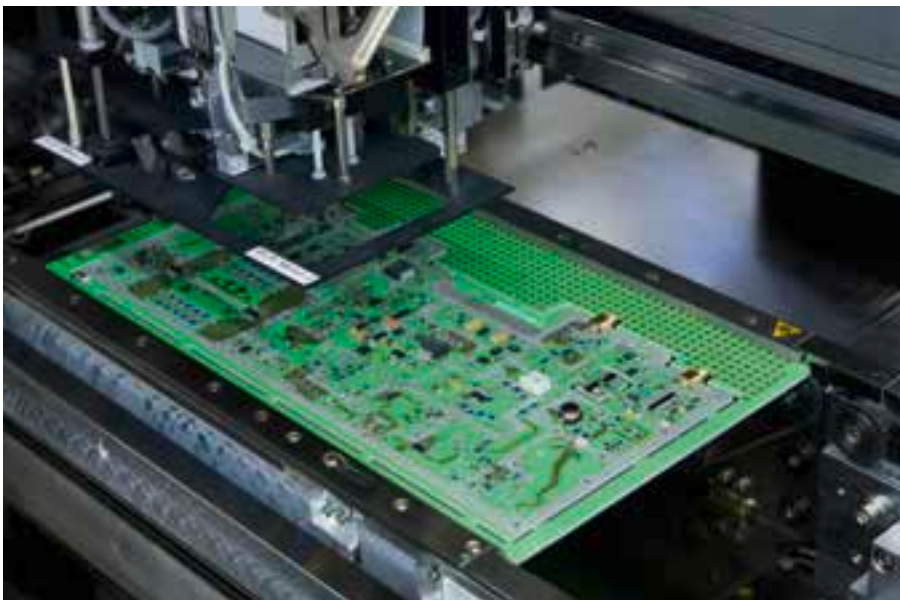
The R&S®BBA150 also sets new standards in terms of mechanical design. Due to its lightweight design and special aluminum-copper heat sink, the R&S®BBA150 weighs only half as much as conventional amplifiers in the same power class. If desired, it is possible to combine different frequency bands in a single amplifier. The RF output power of up to 500 W below 1 GHz and up to 200 W above 1 GHz in just four height units means excellent power density.

Series production in one of Europe's most progressive plants

The R&S®BBA150 broadband amplifiers are series-produced in one of Europe's most progressive plants. The multiple award-winning ¹⁾ Rohde&Schwarz plant in the town of Teisnach (Germany) offers superior manufacturing depth. From precision mechanical engineering and metal-working to printed board production and final assembly, all manufacturing steps are united under the same roof. Automated final test setups ensure that the Rohde&Schwarz plant delivers only specification-compliant products to its customers.

¹⁾ Awards received by the Rohde&Schwarz plant in Teisnach include:

- 2010 and 2014 Factory of the Year, Germany
- 2013 Best Factory, award winner of European industrial excellence competition
- 2014 Bavarian Quality Award



Automated insertion of components into printed boards at Rohde&Schwarz.

Reliable with high availability

Broadband amplifiers as reliable as the sound and TV broadcast transmitters from Rohde & Schwarz

Outstanding expertise in amplifier development

The R&S®BBA150 broadband amplifiers are highly tolerant to mismatch and rugged enough to handle short-circuiting at the RF end or an open RF output. The expertise gained over many years in the development of power amplifiers is based on the R&D work for Rohde & Schwarz sound and TV broadcast transmitters. Their reliability is well-known and a major reason for the company's global market leadership in digital terrestrial transmitter technology.

Cost benefit due to low downtime

The market launch of the R&S®BBA100 broadband amplifier family in 2010 underscored the Rohde & Schwarz claim to offer stable, reliable amplifiers for maximum customer benefit. Low downtime is an important economic factor. The R&S®BBA150 broadband amplifiers are the next logical step along this path.

Transfer of know-how

All the Rohde & Schwarz sound and TV broadcast transmitter manufacturing know-how has gone into the development of the broadband amplifiers.



1963:
VHF FM sound broadcast transmitter with 2 × 5 kW



2010:
R&S®BBA100
broadband amplifier



2013:
R&S®BBA150
broadband amplifier



2014:
R&S®BBL200
broadband amplifier

Flexible control and operation

Operation of the R&S®BBA150 is always efficient, including local and remote control and operation via web GUI.

Manual operation

The R&S®BBA150 is directly operated via the display and the buttons on its front panel. This is ideal for use in labs and makes it easy to change settings. A clever menu structure provides straightforward access to all essential information and possible settings; during operation, the RF output power, reflected power and VSWR are displayed.

Local and remote operation via web browser and PC

The web GUI integrated into the R&S®BBA150 is called up via LAN and web browser. The R&S®BBA150 can be conveniently operated via its graphical user interface using a laptop near the amplifier or a control workstation PC. A common web browser (e.g. Google Chrome, Mozilla Firefox, Microsoft Internet Explorer) is all that is needed.



Display and buttons on the R&S®BBA150 front panel.



Operating panel in the web GUI of the R&S®BBA150.

Integration into the R&S®EMC32 EMC measurement software

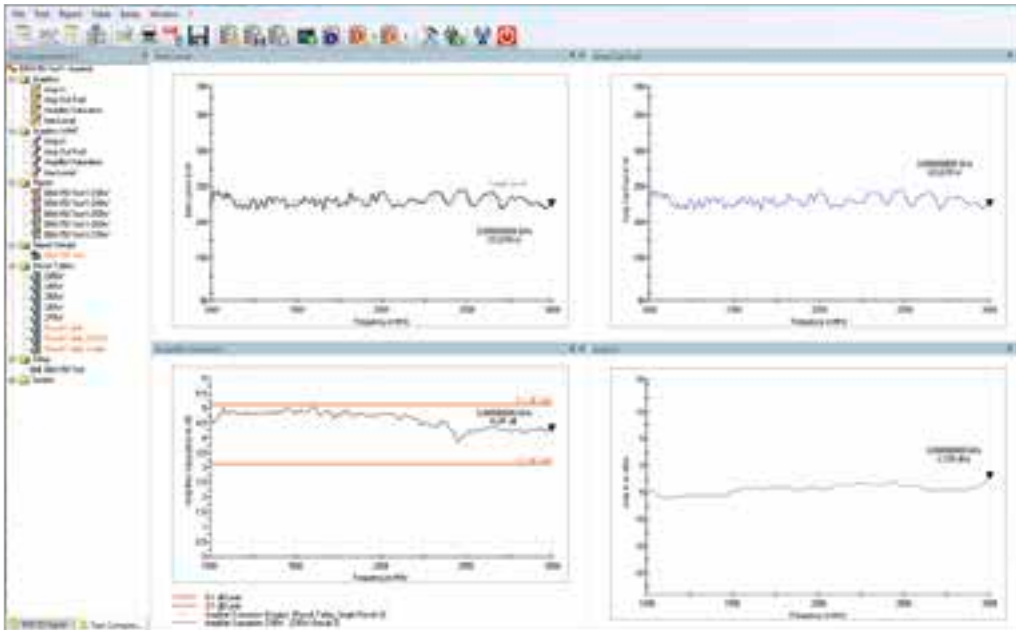
Complex EMC measurement scenarios almost always require the use of higher-level measurement and control software, for example R&S®EMC32. The complete integration of the R&S®BBA150 into the EMC measurement software offers many different options for setting and controlling the amplifier for immunity measurements in line with common standards such as CISPR, IEC, ISO, EN, ETSI, VDE, FCC and ANSI.

Remote control via Ethernet

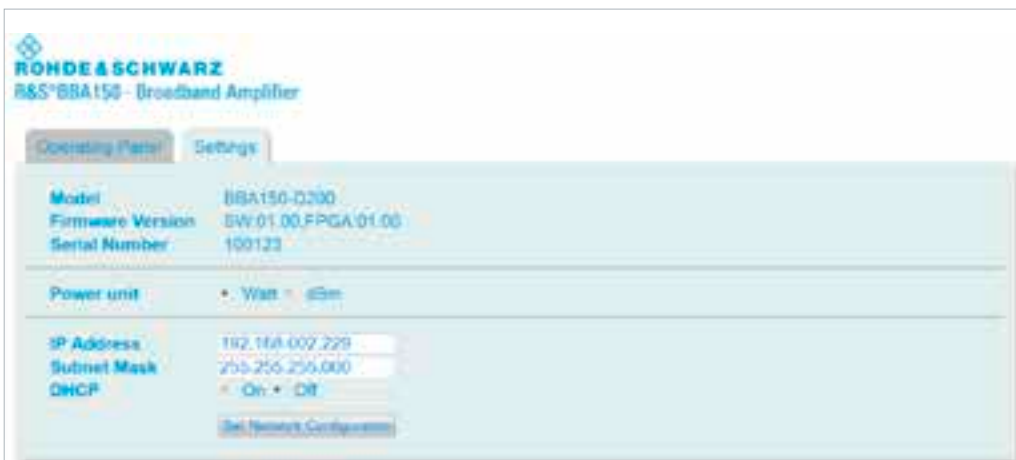
The standard Ethernet interface makes it possible to automate test sequences by remote control commands in line with the SCPI nomenclature. TCP/IP networks are now standard for networking and controlling equipment; separate infrastructure is no longer needed. To make integration especially easy, the R&S®BBA150 allows an IP network address to be set manually or assigned automatically via DHCP.

Safety thanks to two different interlocks

The obligatory device interlock is complemented by another, configurable interlock. The device interlock restarts the amplifier without user interaction as soon as the circuit is closed. The configurable interlock requires a confirmation, either locally on the R&S®BBA150 or via remote control command, before RF power can be output again. This function ensures maximum possible safety and convenient operation.



R&S®EMC32 EMC measurement software.



Settings panel in the web GUI of the R&S®BBA150.

All in one device

The system controller makes it possible to implement amplifier systems with different frequency bands without external control components.

Compact design and modular structure

Though compact, the R&S®BBA150 broadband amplifier offers functions that normally involve significantly higher technical investment. The design is optimized for top flexibility in a small footprint. The compact, modular design of the amplifier stages and other components allows the setup of highly integrated systems based on 19" rackmounts. The rackmounts are scalable such that even complex systems have compact dimensions.

Extensive switching options for inputs, outputs and sample ports

The R&S®BBA150 broadband amplifiers make it possible to integrate different frequency bands into a single amplifier system. The components listed below can be combined as required, providing a unique degree of flexibility when designing amplifier systems.

The input switch is used to connect the RF input signal (e.g. from a signal generator) to one of the frequency bands. As a result, a central input can be used without reconnecting the signal source.

The R&S®BBA150-D110E100 amplifier system is very compact.
The rackmount with a height of only 4 HU contains the following:

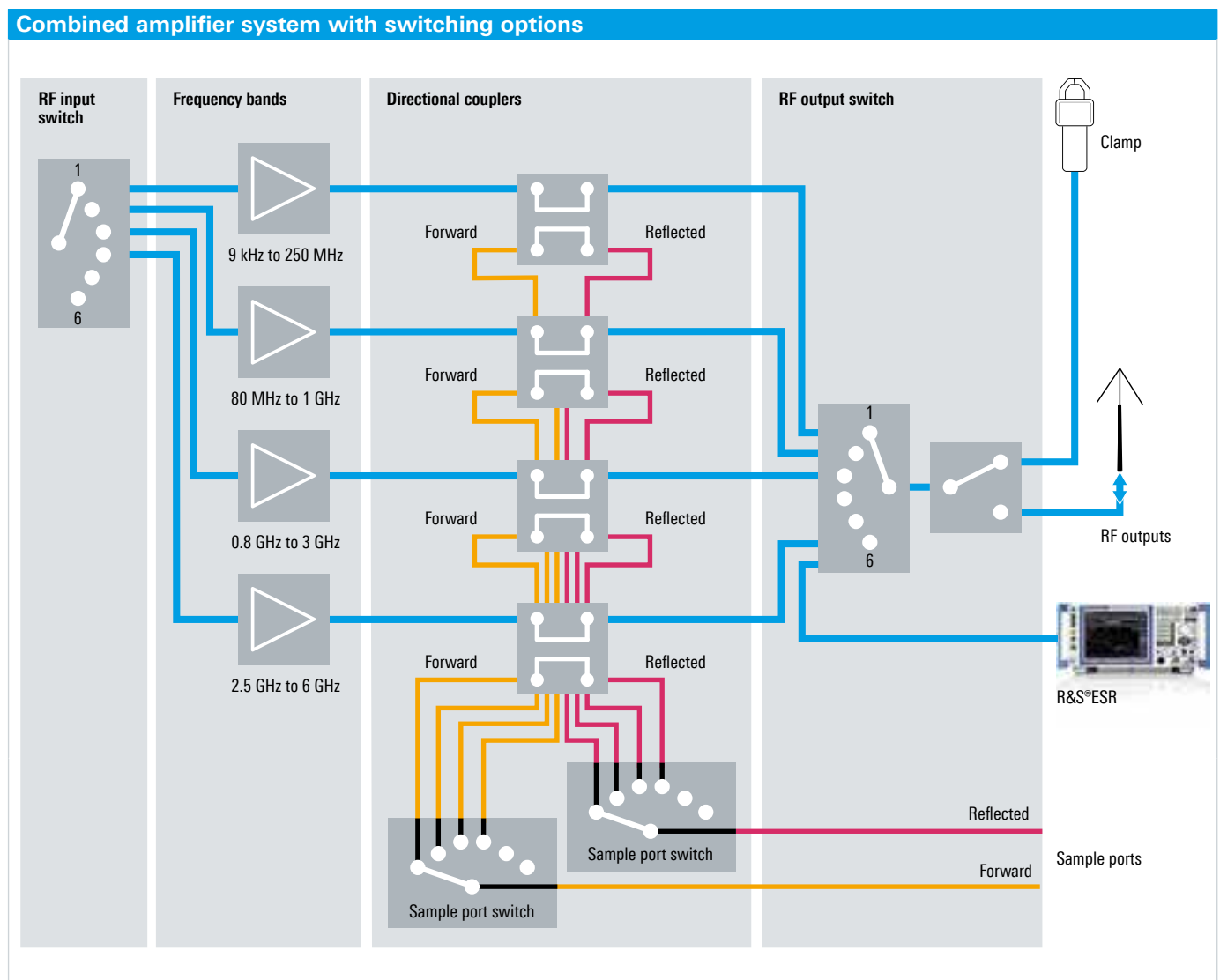
- Power amplifier, frequency band D, 110 W
- Power amplifier, frequency band E, 100 W
- Input switch
- Output switch
- Sample port switch



Optional sample ports are available to measure the forward and reflected power at the amplifier's output. Sample port switches are used to make the sample port signals from the different frequency bands available at two central outputs.

RF output switches allow flexible connection of the frequency bands to different sinks, e.g. clamps or antennas. Different RF output switches can be configured in an application-specific manner.

All switches in the system are controlled via the built-in system controller. The desired RF path can be selected with a single remote control command or press of a button. An RF path represents the signal path from the input to the output of the amplifier system.



Excellent service and quick maintenance

Minimal downtime due to modular design and worldwide service

Outstanding service concept

The modular structure of the R&S®BBA150 allows problems to be remedied quickly and keeps downtime to a minimum. All of the amplifier's components are designed as modules and can usually be replaced at the local Rohde&Schwarz office or the nearest service center. Spare parts are available worldwide.

If the problem cannot be fixed at the local service center, the amplifier will be repaired at the plant within a maximum of ten working days (plus shipping time).

Extended warranty for maximum protection of investment

The extended warranty offers optimal performance and availability of an R&S®BBA150 broadband amplifier at low, calculable operating cost. The terms of one to four years (WE1 to WE4) – in addition to the three-year warranty – provide long-term investment protection.

From pre-sale to service – at your doorstep

Rohde&Schwarz is a technology group of companies with a global presence. More than 9000 employees maintain direct customer contact in over 70 countries. The Rohde&Schwarz network in over 70 countries ensures optimum on-site support by highly qualified experts. The user risks are reduced to a minimum at all stages of the project:

- Solution finding/purchase
- Technical startup/application development/integration
- Training
- Operation/calibration/repair

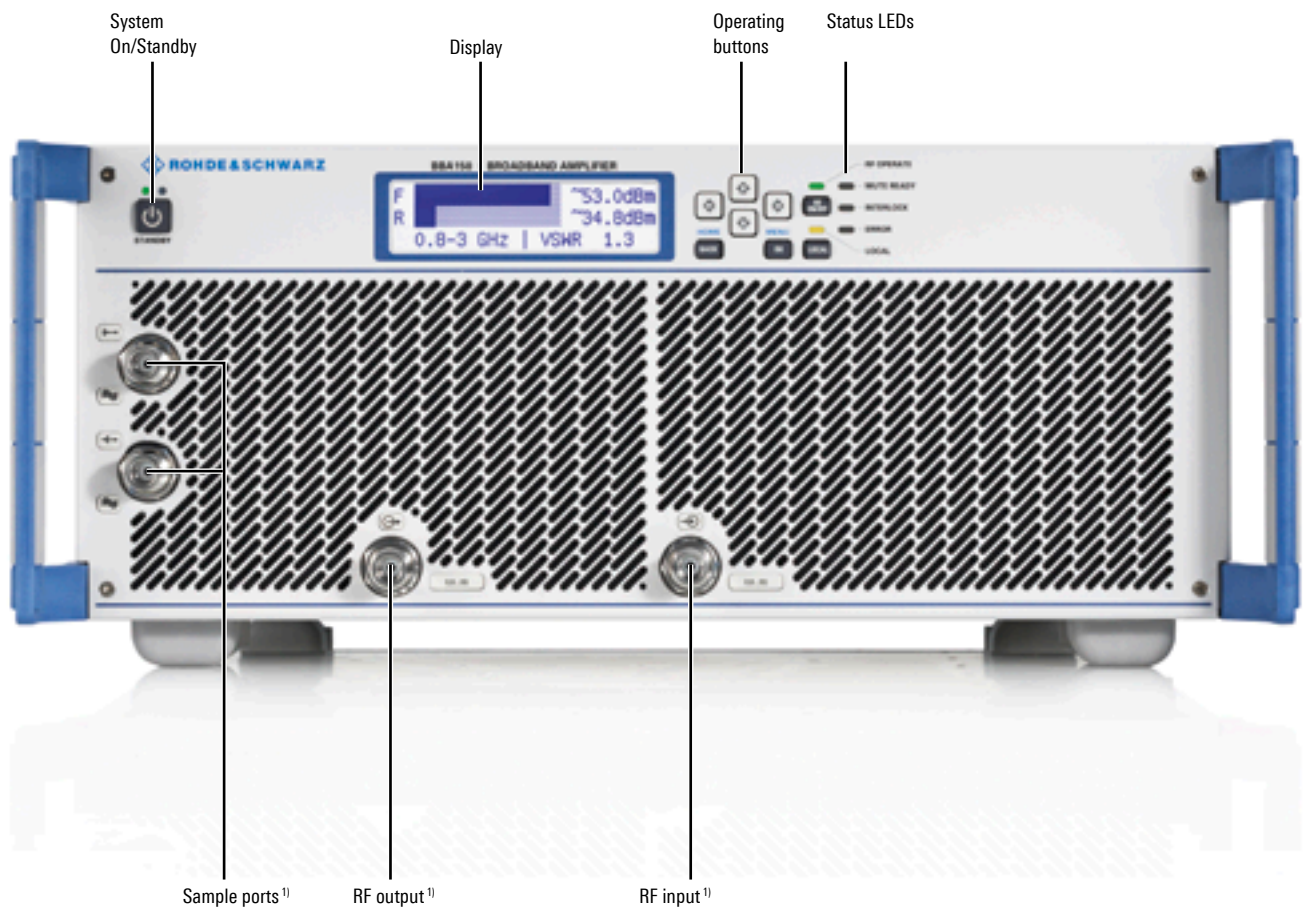
Rohde&Schwarz has the experience needed to offer all customers a customized solution tailored to their requirements.



Front view

Desktop model

Functional elements

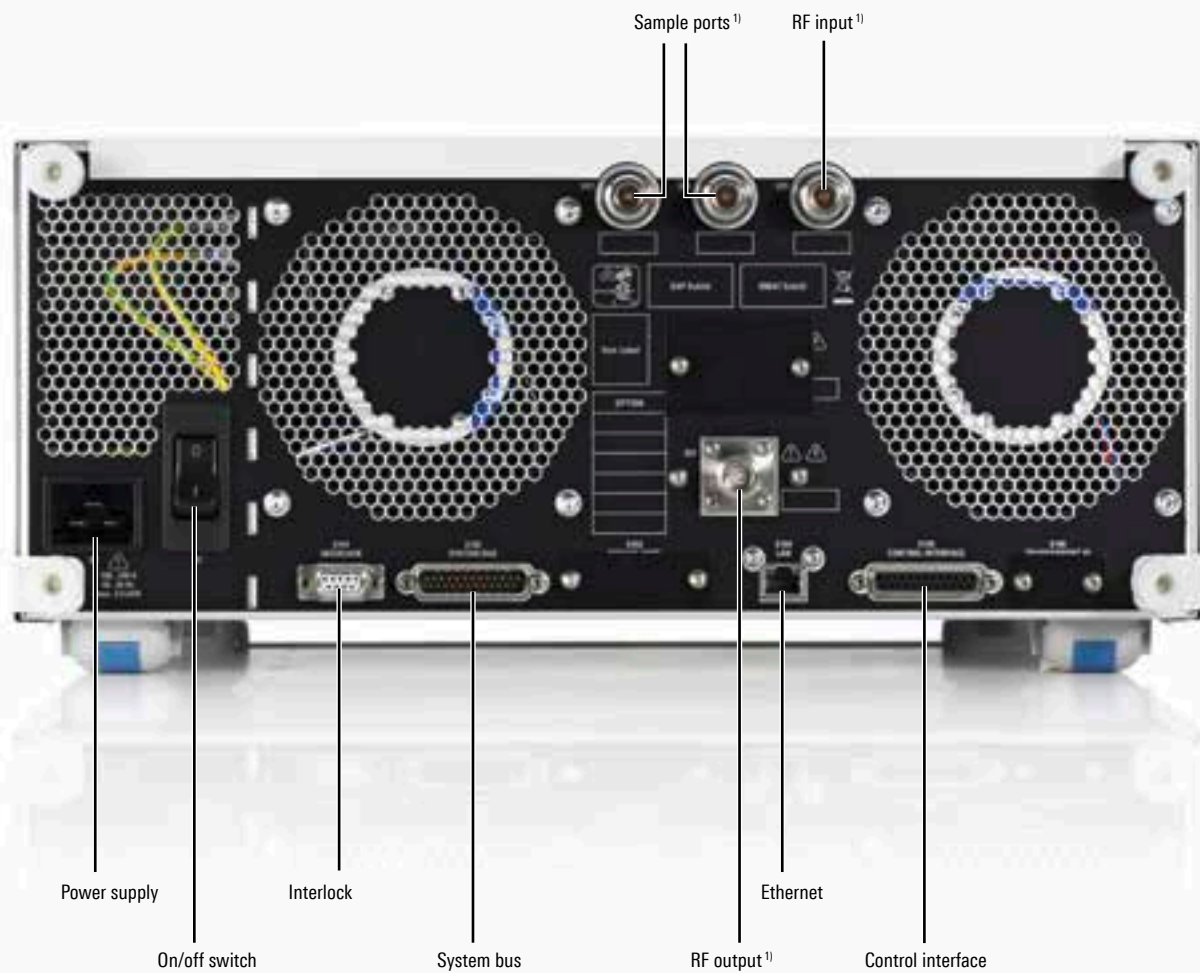


¹⁾ Optional or configuration-dependent.

Rear view

Desktop model

Functional elements



¹⁾ Optional or configuration-dependent.

Specifications in brief

Specifications in brief		
RF specifications		
Frequency bands		9 kHz to 250 MHz, instantaneously; 80 MHz to 1.0 GHz, instantaneously; 0.8 GHz to 3.0 GHz, instantaneously; 2.5 GHz to 6.0 GHz, instantaneously
Nominal output power	9 kHz to 250 MHz	125 W to 200 W
	80 MHz to 1.0 GHz	70 W to 1000 W
	0.8 GHz to 3.0 GHz	30 W to 400 W
	2.5 GHz to 6.0 GHz	15 W to 200 W
Nominal output load		50 Ω
Gain flatness		± 3.0 dB (or better; see data sheet)
Gain adjustment range		> 15 dB
Modulation capability		AM, FM, ϕ M, PM
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Nominal output impedance		50 Ω
Output mismatch tolerance		100%
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female or 7/16 DIN female
	or rear panel	N female or 7/16 DIN female
RF sample ports	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample ports	forward output power, optional	N female
	reflected output power, optional	N female
Graphical user interface		
Local graphical display		200 \times 48 pixel, monochrome
Web GUI	via Ethernet	RJ-45, 10/100 Mbit/s, autonegotiation, half/full duplex
Remote control		
Ethernet		RJ-45, 10/100 Mbit/s, autonegotiation, half/full duplex
General data		
Operating voltage range		100 V to 240 V AC \pm 10%, single phase, 50 Hz to 60 Hz \pm 6%
	R&S®BBA150-BC500	200 V to 240 V AC \pm 10%, single phase, 50 Hz to 60 Hz \pm 6%
	R&S®BBA150-BC1000	200 V to 240 V AC \pm 10%, three phase, 50 Hz to 60 Hz \pm 6%
Air cooling		forced air, built-in fans, air entry at front, air exit at rear
Dimensions		
Desktop model	incl. fans, handles and feet; W \times H \times D	430 mm \times 196 mm \times 580 mm (16.93 in \times 7.72 in \times 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Rack model	W \times H \times D	19" \times 12 HU \times 800 mm

Specifications in brief		
Environmental conditions		
Temperature loading	operating temperature range	0°C to +40°C
	storage temperature range	–20°C to +70°C
Damp heat		max. +40°C at 95% rel. humidity, without condensation
Altitude	operating altitude	up to 2000 m
	storage altitude	up to 4600 m
Protection		
Input overdrive	without damage	max. +15 dBm
Load VSWR		infinite
Interlock		1 device interlock, 1 configurable interlock
Input protection against bias voltage	optional	DC block level ≤ 50 V DC
Transient voltage compatibility		category II, in line with IEC 60364-4-443
Short-circuit breaking capacity		automatic all-pole 20 A circuit breaker
Thermal overload		shutdown in case of thermal overload

All specified parameters are valid for an ambient temperature of +25°C, input impedance of 50 Ω and output impedance of 50 Ω.

For data sheet, see PD 3606.7247.22 and www.rohde-schwarz.com

Ordering information

Designation	Type	Configuration No.
R&S®BBA150 single-band power amplifiers		
Frequency band from 9 kHz to 250 MHz		
125 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A125
160 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A160
200 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A200
Frequency band from 80 MHz to 1.0 GHz		
70 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-BC70
125 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-BC125
250 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-BC250
500 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-BC500
1000 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-BC1000
Frequency band from 0.8 GHz to 3.0 GHz		
30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D30
60 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60
110 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110
200 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D200
400 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D400
Frequency band from 2.5 GHz to 6.0 GHz		
15 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-E15
30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-E30
60 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-E60
100 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-E100
200 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-E200
Accessories supplied: power cord, user manual on CD.		

Designation	Type	Configuration No.
R&S®BBA150 dual-band power amplifiers ¹⁾		
Frequency bands from 0.8 GHz to 3.0 GHz and from 2.5 GHz to 6.0 GHz		
30 W/15 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D30E15
30 W/30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D30E30
60 W/15 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60E15
60 W/30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60E30
60 W/60 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60E60
110 W/30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110E30
110 W/60 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110E60
110 W/100 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110E100
Frequency bands from 9 kHz to 250 MHz and from 80 MHz to 1 GHz		
125 W/70 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A125BC70
125 W/125 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A125BC125
200 W/70 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A200BC70
200 W/125 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-A200BC125
Accessories supplied: power cord, user manual on CD.		
Options		
GPIO Remote Control (external add-on)	R&S®BBA-B101	5355.8189.00
RF Input Switch (N)	R&S®BBA-B110	5355.8866.02
RF Output Switch (N, max. 200 W)	R&S®BBA-B120	5355.8795.02
Fast Amplifier Mute	R&S®BBA-B130	5355.8114.02
DC Block Input Protection (N)	R&S®BBA-B132	5353.9236.03
RF Forward/RF Reflected Sample Ports (N front)	R&S®BBA-B140	5355.8837.02
RF Forward/RF Reflected Sample Ports (N rear)	R&S®BBA-B140	5355.8837.03
Detected Forward/Detected Reflected Sample Ports (N front)	R&S®BBA-B141	5355.8850.02
Detected Forward/Detected Reflected Sample Ports (N rear)	R&S®BBA-B141	5355.8850.03
Sample Port Switch (dual-port, N front)	R&S®BBA-B142	5355.8872.02
Sample Port Switch (dual-port, N rear)	R&S®BBA-B142	5355.8872.03
Transparent I/O	R&S®BBA-B160	5355.8889.02

¹⁾ Amplifier systems with two or more frequency bands are available in many combinations. The table shows only a selection of the multiband power amplifiers.

Service options		
Frequency Range/Output Power Upgrade	R&S®BBA-UPGR	on request
Extended Warranty, one year	R&S®WE1	Please contact your local Rohde&Schwarz sales office.
Extended Warranty, two years	R&S®WE2	
Extended Warranty, three years	R&S®WE3	
Extended Warranty, four years	R&S®WE4	

Your local Rohde&Schwarz expert will help you determine the optimum solution for your requirements. To find your nearest Rohde&Schwarz representative, visit www.sales.rohde-schwarz.com

Service that adds value

- ▮ Worldwide
- ▮ Local and personalized
- ▮ Customized and flexible
- ▮ Uncompromising quality
- ▮ Long-term dependability

About Rohde & Schwarz

The Rohde & Schwarz electronics group is a leading supplier of solutions in the fields of test and measurement, broadcast and media, secure communications, cyber security, and radiomonitoring and radiolocation. Founded more than 80 years ago, this independent global company has an extensive sales network and is present in more than 70 countries. The company is headquartered in Munich, Germany.

Sustainable product design

- ▮ Environmental compatibility and eco-footprint
- ▮ Energy efficiency and low emissions
- ▮ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

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R&S®BBA150 Broadband Amplifier

Data without tolerance limits is not binding | Subject to change

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R&S® BBA150

Broadband Amplifier

Specifications



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Specifications apply under the following conditions: 15 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, and all internal automatic adjustments performed. "Typical values" are designated with the abbreviation "typ.". These values are verified during the final test but are not assured by Rohde & Schwarz. "Nominal values" are design parameters that are not assured by Rohde & Schwarz. These values are verified during product development but are not specifically tested during production.

Rohde & Schwarz equipment is designed for reliable operation up to an altitude of 2000 m above sea level, and for transport up to an altitude of 4600 m above sea level.

All specified parameters are valid for an ambient temperature of +25 °C, input impedance of 50 Ω and output impedance of 50 Ω. Data without tolerance limits is not binding.

RoHS Europe, Directive 2011/65/EU: Equipment category 9, fulfilled without any exceptions.

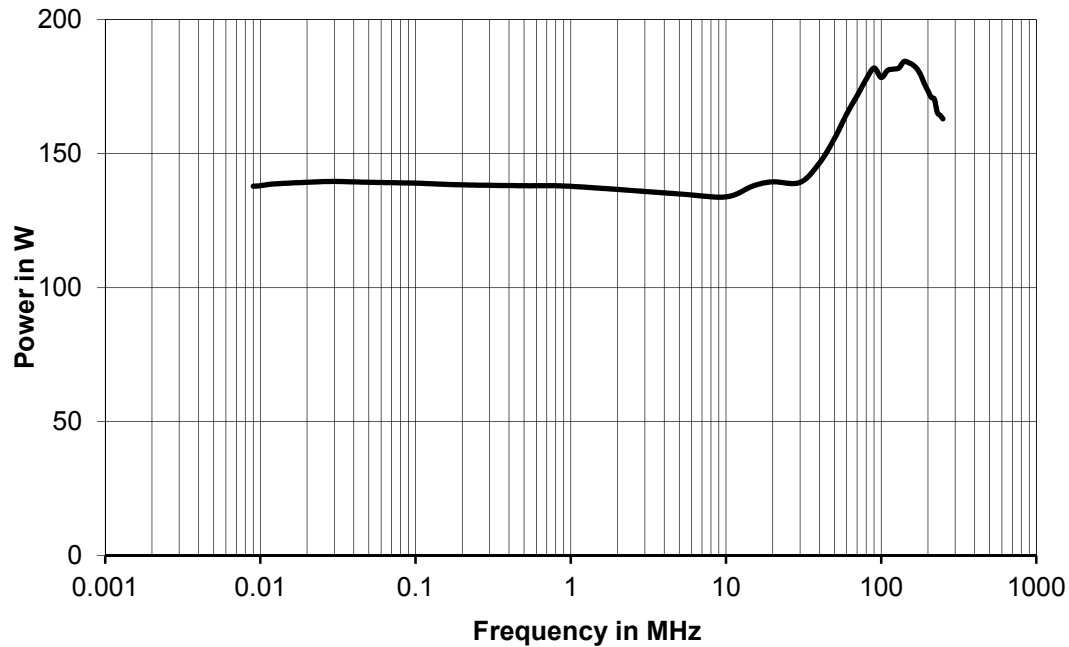
WEEE Europe, Directive 2002/96/EC:

No disposing with unsorted municipal waste; no return with collection of waste electrical and electronic equipment from private households. Separate collection necessary. Ask Rohde & Schwarz representatives about recovery.

Frequency band from 9 kHz to 250 MHz

Power class 125 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		9 kHz to 250 MHz instantaneously
Nominal output load		50 Ω
Nominal output power	9 kHz to 50 MHz	125 W (51.0 dBm)
	50 MHz to 225 MHz	140 W (51.5 dBm)
	225 MHz to 250 MHz	125 W (51.0 dBm)
Output power		min. 125 W (51.0 dBm)
Power output at 1 dB compression		min. 125 W (51.0 dBm)
Nominal power gain		54.4 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 125 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 100 kHz apart, 200 kHz to 1 MHz	min. 57 dBm
	test frequencies 1 MHz apart, 1 MHz to 250 MHz	min. 57 dBm
	carrier offset > 100 kHz	< -80 dBc
Spurious	at maximum gain	nom. < 16 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	continuous, without foldback
	at VSWR > 6:1	continuous, with gradual foldback to approx. 50 % of output power, depending on load impedance
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 55 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 16 kg (35 lb)

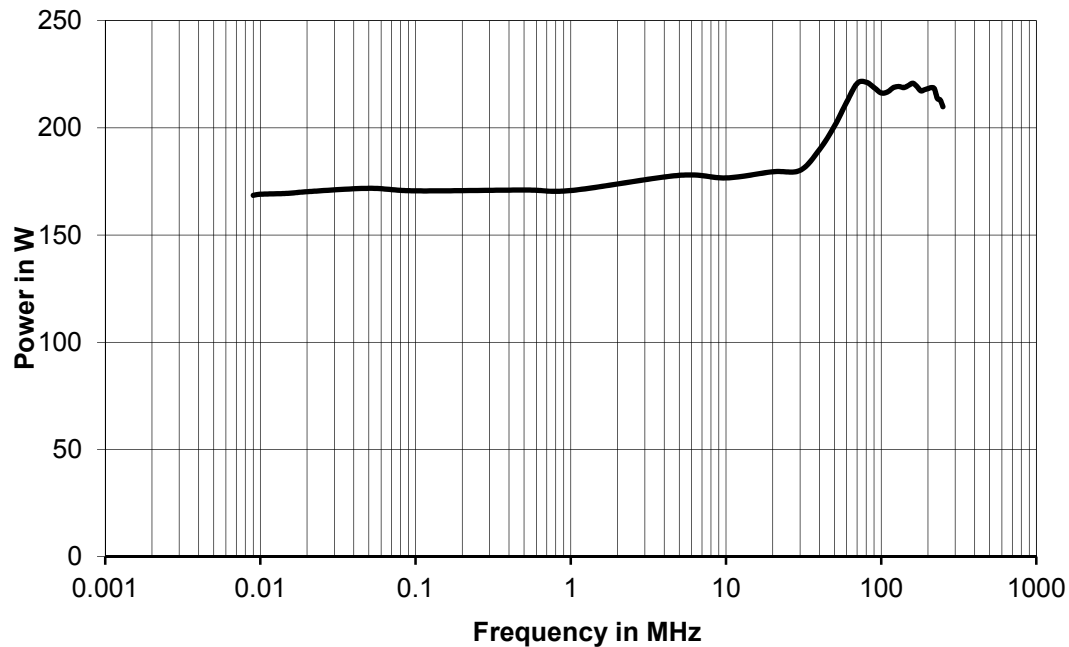
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	9.1 A
	at 230 V	4.4 A
Rated power	RF _{cw} = 125 W (eff.), VSWR = 1	1.0 kVA

Power class 160 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		9 kHz to 250 MHz instantaneously
Nominal output load		50 Ω
Nominal output power	9 kHz to 50 MHz	160 W (52.0 dBm)
	50 MHz to 225 MHz	180 W (52.6 dBm)
	225 MHz to 250 MHz	160 W (52.0 dBm)
Output power		min. 160 W (52.0 dBm)
Power output at 1 dB compression		min. 160 W (52.0 dBm)
Nominal power gain		55.4 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 160 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 100 kHz apart, 200 kHz to 1 MHz	min. 57 dBm
	test frequencies 1 MHz apart, 1 MHz to 250 MHz	min. 57 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 16 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	continuous, without foldback
	at VSWR > 6:1	continuous, with gradual foldback to approx. 50 % of output power, depending on load impedance
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 55 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 16 kg (35 lb)

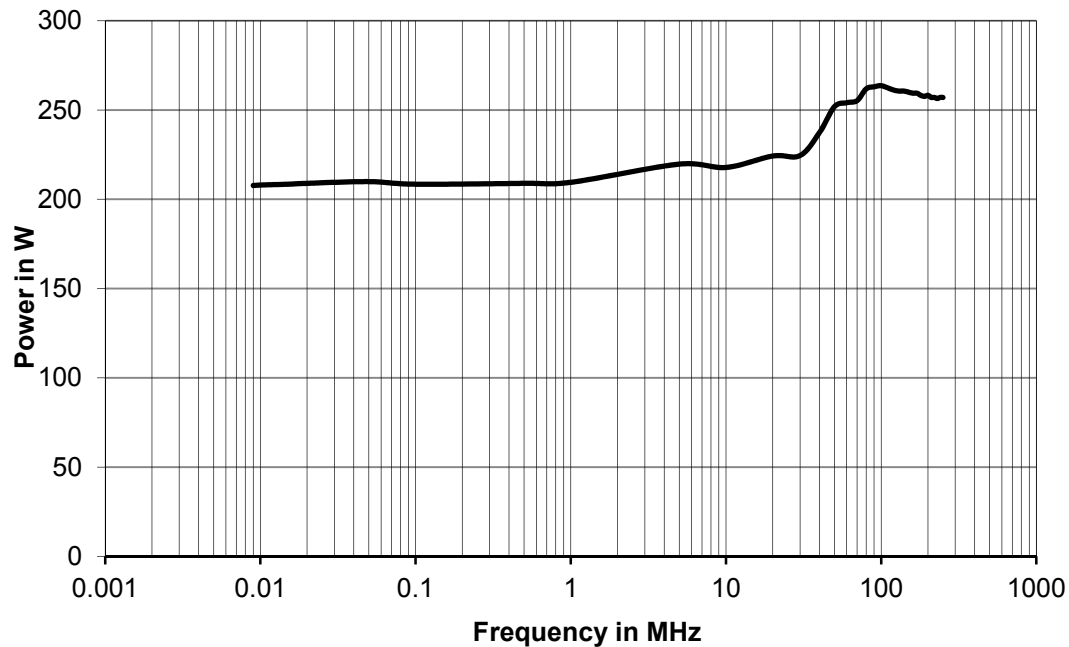
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	9.1 A
	at 230 V	4.4 A
Rated power	RF _{cw} = 160 W (eff.), VSWR = 1	1.0 kVA

Power class 200 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		9 kHz to 250 MHz instantaneously
Nominal output load		50 Ω
Nominal output power	9 kHz to 50 MHz	200 W (53.0 dBm)
	50 MHz to 225 MHz	230 W (53.6 dBm)
	225 MHz to 250 MHz	200 W (53.0 dBm)
Output power		min. 200 W (53.0 dBm)
Power output at 1 dB compression		min. 200 W (53.0 dBm)
Nominal power gain		56.4 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 200 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 100 kHz apart, 200 kHz to 1 MHz	min. 57 dBm
	test frequencies 1 MHz apart, 1 MHz to 250 MHz	min. 57 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 16 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	continuous, without foldback
	at VSWR > 6:1	continuous, with gradual foldback to approx. 50 % of output power, depending on load impedance
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 55 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 16 kg (35 lb)

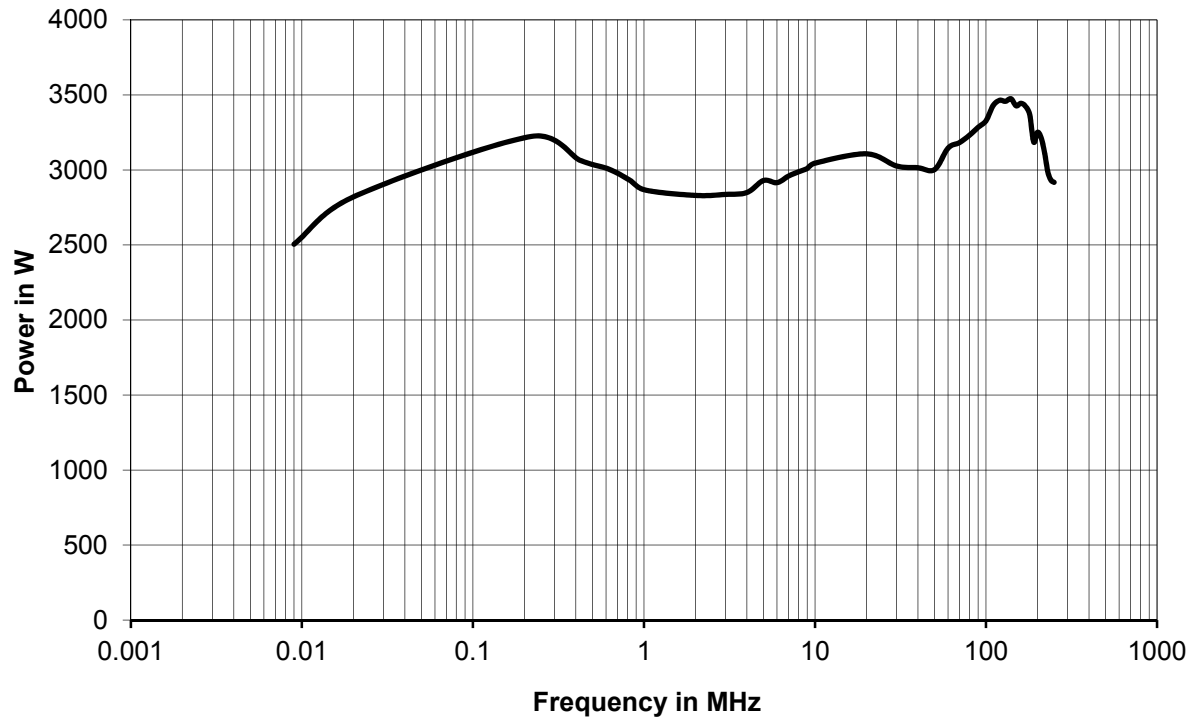
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	9.1 A
	at 230 V	4.4 A
Rated power	RF _{cw} = 200 W (eff.), VSWR = 1	1.0 kVA

Power class 2500 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		9 kHz to 250 MHz instantaneously
Nominal output load		50 Ω
Nominal output power		2500 W (64.0 dBm)
Output power	9 kHz to 20 kHz	min. 2500 W (64.0 dBm)
	20 kHz to 220 MHz	min. 3000 W (64.8 dBm)
	220 MHz to 250 MHz	min. 2500 W (64.0 dBm)
Power output at 1 dB compression		min. 2500 W (64.0 dBm)
Nominal power gain		67.4 dB
Gain flatness		± 2.3 dB
Gain adjustment range		> 15 dB
Harmonics	at 2500 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 100 kHz apart, 200 kHz to 1 MHz	> 70 dBm
	test frequencies 1 MHz apart, 1 MHz to 250 MHz	> 70 dBm
	carrier offset > 100 kHz	-80 dBc, max. -70 dBc
Spurious	9 kHz to 50 MHz	nom. < 16.0 dB
Noise figure	50 MHz to 250 MHz	nom. < 9.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+5 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	continuous, without foldback
	at VSWR > 6:1	continuous, with gradual foldback to approx. 50 % of output power, depending on load impedance
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 70 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.1 V to 3.0 V DC

Mechanical specifications

System size		
Dimensions	rack setup	19" rack, 35 HU, depth 800 (31.5 in)
Weight	amplifier system incl. rack	approx. 280 kg (617 lb)

RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	1 5/8" EIA female
	or rear panel	1 5/8" EIA female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

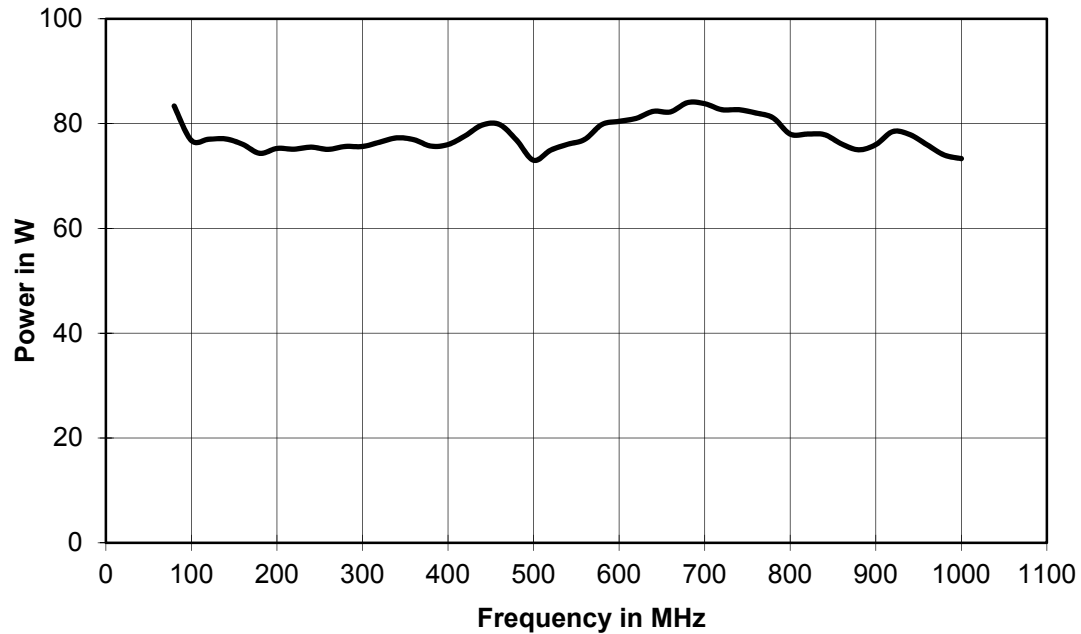
Electrical specifications

AC supply voltage		
Nominal operating voltage range	standard	380 to 415 V AC \pm 10 %, three phase with N, 50 Hz to 60 Hz \pm 6 %
	on request	208 V to 240 V AC \pm 10 %, three phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 230 V per phase	28.3 A/14.1 A/14.1 A
Rated power	RF _{OW} = 2500 W (eff.), VSWR = 1	13.0 kVA

Frequency band from 80 MHz to 1 GHz

Power class 70 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		80 MHz to 1 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		70 W (48.5 dBm)
Output power		min. 80 W (49.0 dBm)
Power output at 1 dB compression		min. 70 W (48.5 dBm)
Nominal power gain		51.9 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 70 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 58 dBm
Spurious	carrier offset > 100 kHz	< -65 dBc, typ. < -70 dBc
Noise figure	at maximum gain	nom. < 10 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 57 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 16 kg (35 lb)

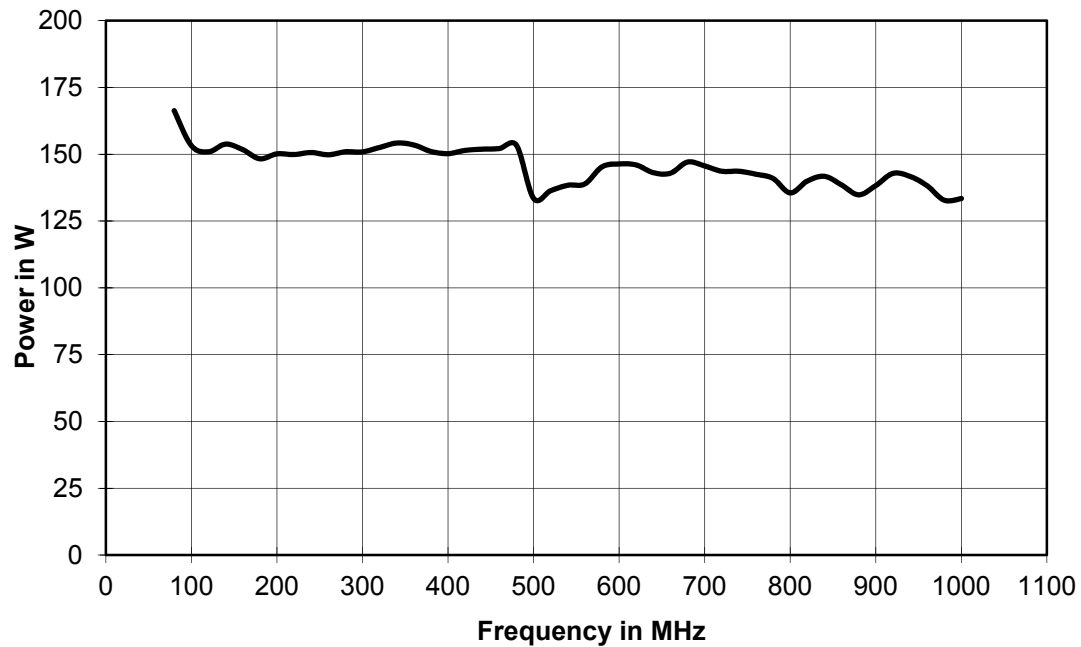
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	7.7 A
	at 230 V	3.7 A
Rated power	RF _{cw} = 70 W (eff.), VSWR = 1	850 VA

Power class 125 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		80 MHz to 1 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		125 W (51.0 dBm)
Output power	< 400 MHz	min. 150 W (51.8 dBm)
	> 400 MHz	min. 135 W (51.3 dBm)
Power output at 1 dB compression	< 400 MHz	min. 140 W (51.5 dBm)
	> 400 MHz	min. 125 W (51.0 dBm)
Nominal power gain		54.4 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 125 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 58 dBm
Spurious	carrier offset > 100 kHz	< -65 dBc, typ. < -70 dBc
Noise figure	at maximum gain	nom. < 10 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 57 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 16 kg (35 lb)

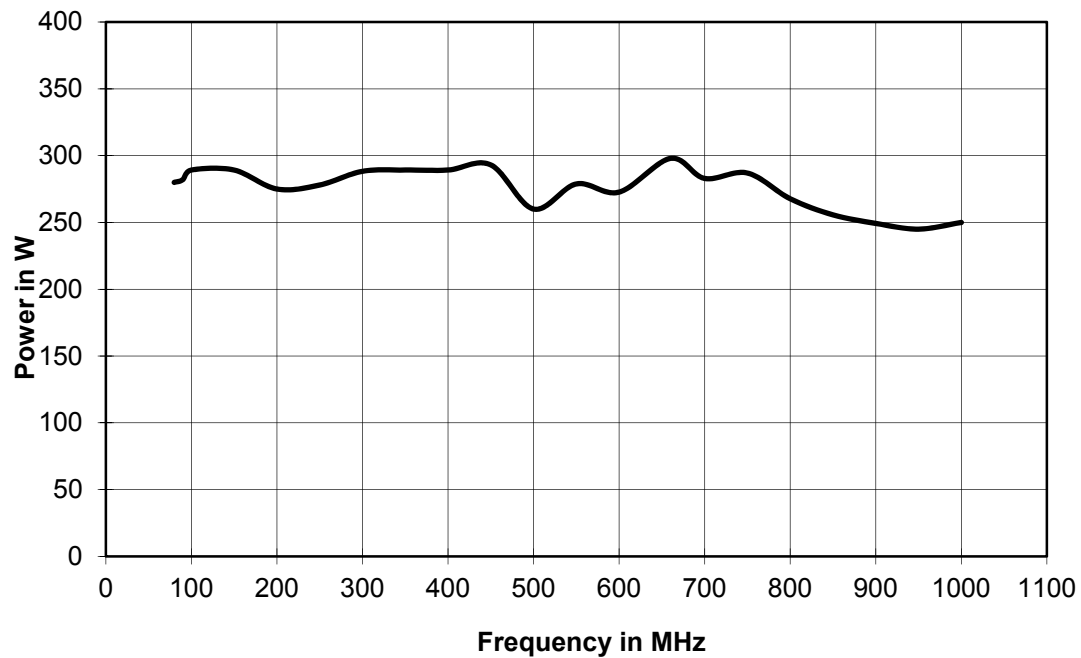
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	7.7 A
	at 230 V	3.7 A
Rated power	RF _{cw} = 125 W (eff.), VSWR = 1	850 VA

Power class 250 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		80 MHz to 1 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		250 W (54.0 dBm)
Output power		min. 280 W (54.5 dBm)
Power output at 1 dB compression	< 400 MHz	min. 275 W (54.4 dBm)
	> 400 MHz	min. 225 W (53.5 dBm)
Nominal power gain		57.4 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 250 W, entire band except 320 MHz to 550 MHz	< -20 dBc
	at 250 W, 320 MHz to 550 MHz	< -17 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 61 dBm
Spurious	carrier offset > 100 kHz	< -65 dBc, typ. < -70 dBc
Noise figure	at maximum gain	nom. < 10 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 57 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 21 kg (46 lb)

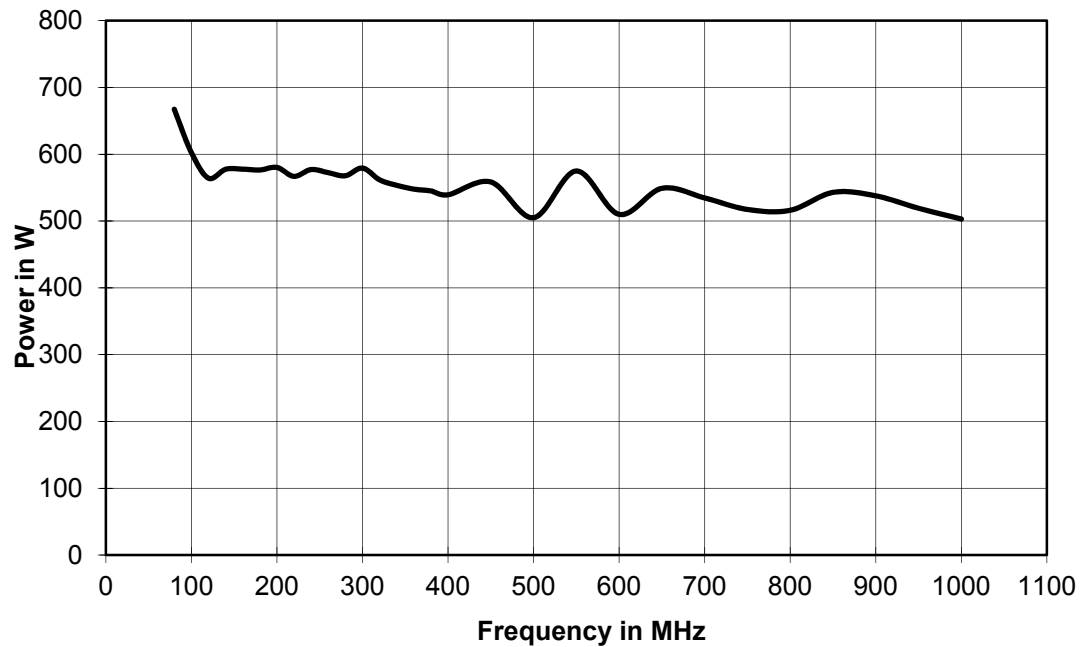
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	15.4 A
	at 230 V	7.4 A
Rated power	RF _{cw} = 250 W (eff.), VSWR = 1	1.7 kVA

Power class 500 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		80 MHz to 1 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		500 W (57.0 dBm)
Output power	< 400 MHz	min 580 W (57.6 dBm)
	> 400 MHz	min 530 W (57.2 dBm)
Power output at 1 dB compression	< 400 MHz	min. 550 W (57.4 dBm)
	> 400 MHz	min. 480 W (56.8 dBm)
Nominal power gain		60.4 dB
Gain flatness		± 2.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 500 W, entire band except 320 MHz to 550 MHz	< -20 dBc
	at 500 W, 320 MHz to 550 MHz	< -17 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 63.5 dBm
Spurious	carrier offset > 100 kHz	< -75 dBc
Noise figure	at maximum gain	nom. < 10 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 57 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 33 kg (73 lb)

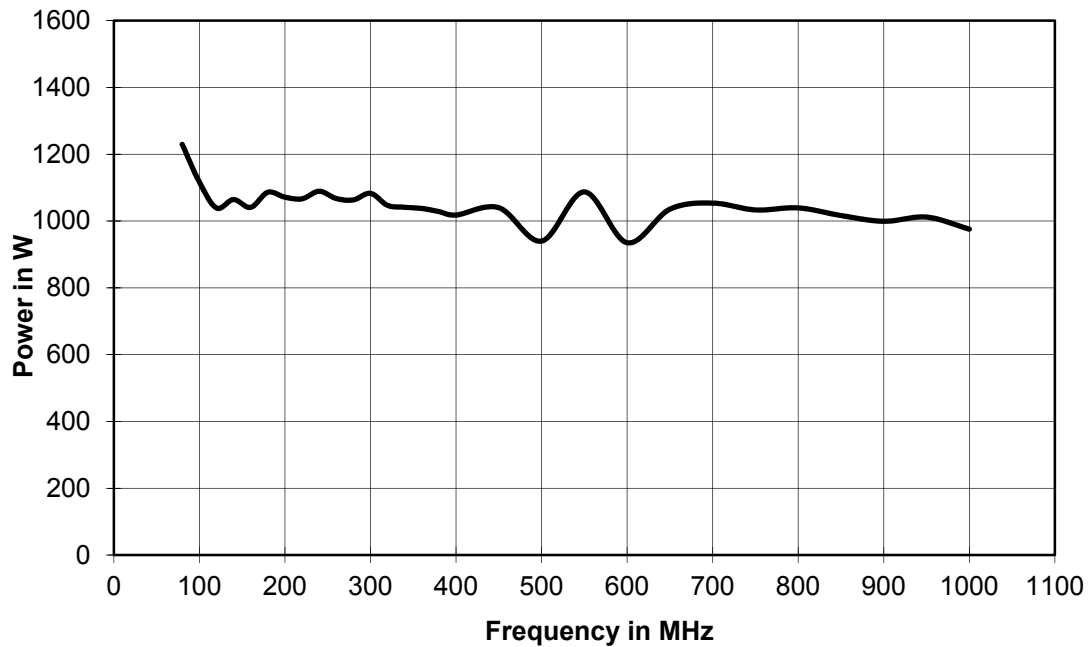
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		200 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 230 V	12.0 A
Rated power	RF _{cw} = 500 W (eff.), VSWR = 1	2.75 kVA

Power class 1000 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		80 MHz to 1 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		1000 W (60.0 dBm)
Output power	< 400 MHz	min. 1025 W (60.1 dBm)
	> 400 MHz	min. 925 W (59.7 dBm)
Power output at 1 dB compression	< 400 MHz	min. 1000 W (60.0 dBm)
	> 400 MHz	min. 850 W (59.3 dBm)
Nominal power gain		63.4 dB
Gain flatness		± 3 dB
Gain adjustment range		> 15 dB
Harmonics	at 1000 W, entire band except 320 MHz to 550 MHz	< -20 dBc
	at 1000 W, 320 MHz to 550 MHz	< -17 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 66 dBm
Spurious	carrier offset > 100 kHz	< -75 dBc
Noise figure	at maximum gain	nom. < 10 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 63 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	rack setup	19" rack, 12 HU, depth 800 mm (31.5 in)
Weight	amplifier system incl. rack	approx. 120 kg (265 lb)

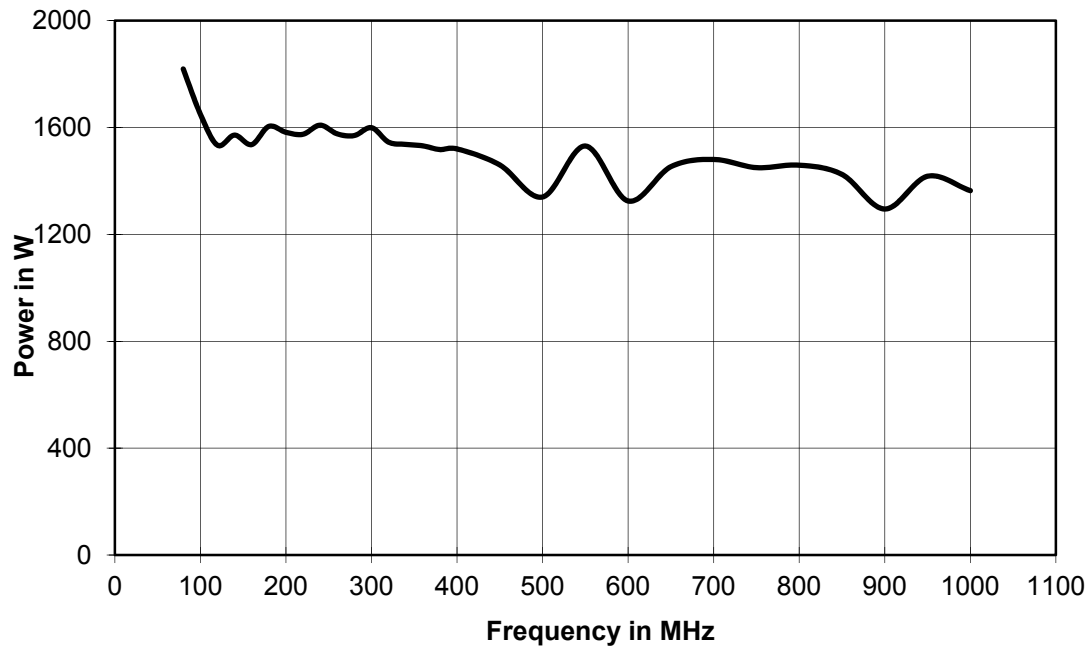
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	rear panel	7/16 DIN female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range	standard	380 to 415 V AC \pm 10 %, three phase with N, 50 Hz to 60 Hz \pm 6 %
	on request	208 V to 240 V AC \pm 10 %, three phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 230 V per phase	13.0 A/13.0 A/0.1 A
Rated power	RF _{cw} = 1000 W (eff.), VSWR = 1	6.0 kVA

Power class 1500 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		80 MHz to 1 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		1500 W (61.8 dBm)
Output power	80 MHz to 400 MHz	min. 1550 W (62.0 dBm)
	400 MHz to 1 GHz	min. 1400 W (61.5 dBm)
Power output at 1 dB compression	80 MHz to 400 MHz	min. 1500 W (61.8 dBm)
	400 MHz to 1 GHz	min. 1300 W (61.2 dBm)
Nominal power gain		65.0 dB
Gain flatness		± 3.5 dB
Gain adjustment range		> 15 dB
Harmonics	at 1500 W, entire band except 320 MHz to 550 MHz	< -20 dBc
	at 1500 W, 320 MHz to 550 MHz	< -17 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 67.7 dBm
Spurious	carrier offset > 100 kHz	< -75 dBc
Noise figure	at maximum gain	nom. < 10 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 63 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.6 V to 3 V DC

Mechanical specifications

System size		
Dimensions	rack setup	19" rack, 20 HU, depth 1000 mm (39.4 in)
Weight	amplifier system incl. rack	approx. 180 kg (397 lb)

RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	rear panel	1 5/8" EIA female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

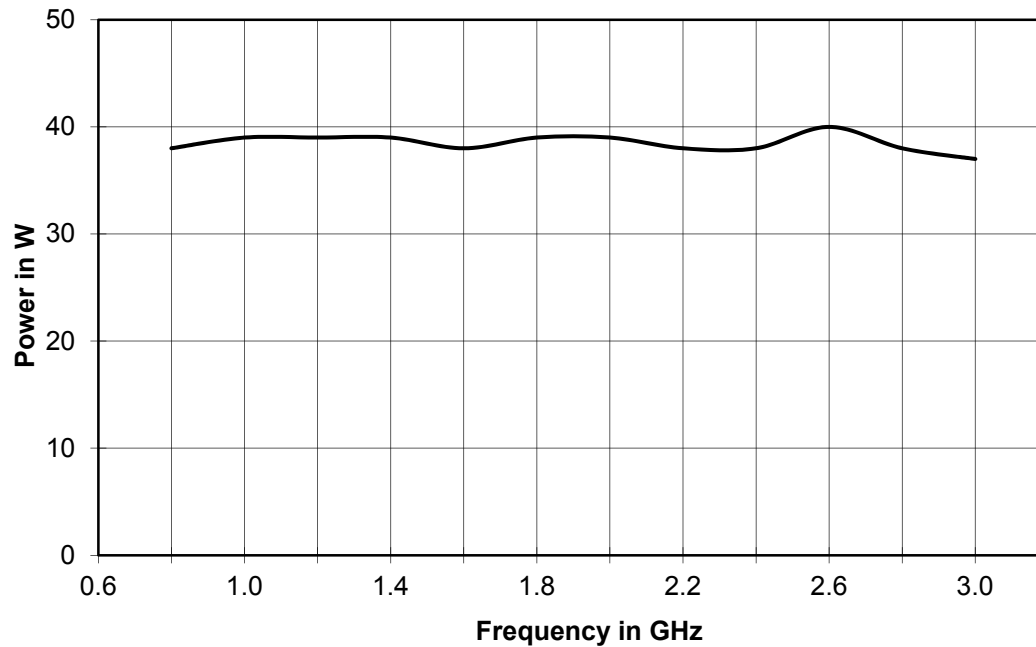
Electrical specifications

AC supply voltage		
Nominal operating voltage range	standard	380 to 415 V AC \pm 10 %, three phase with N, 50 Hz to 60 Hz \pm 6 %
	on request	208 V to 240 V AC \pm 10 %, three phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 230 V per phase	11.6 A
Rated power	RF _{cw} = 1500 W (eff.), VSWR = 1	8.0 kVA

Frequency band from 0.8 GHz to 3.0 GHz

Power class 30 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		0.8 GHz to 3.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		30 W (44.8 dBm)
Output power		min. 35 W (45.4 dBm)
Power output at 1 dB compression		min. 30 W (44.8 dBm)
Nominal power gain		48.2 dB
Gain flatness		± 2.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 30 W, < 1.1 GHz	< -19 dBc
	at 30 W, ≥ 1.1 GHz	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 51.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 10.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 11 kg (24 lb)

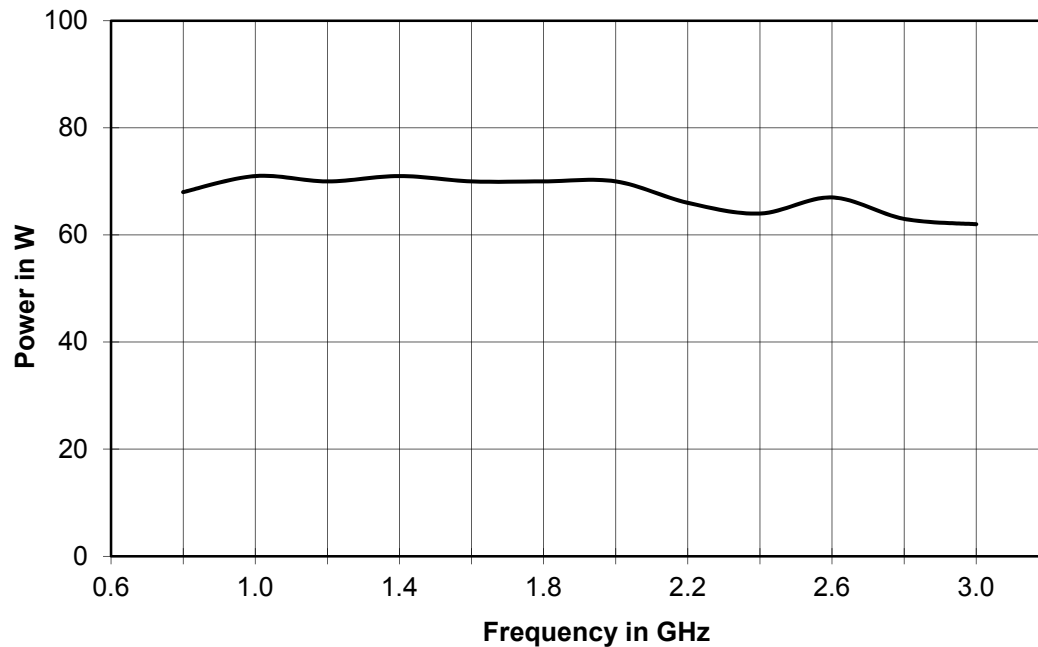
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	2.7 A
	at 230 V	1.3 A
Rated power	RF _{cw} = 30 W (eff.), VSWR = 1	300 VA

Power class 60 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		0.8 GHz to 3.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		60 W (47.8 dBm)
Output power		min. 65 W (48.1 dBm)
Power output at 1 dB compression	< 2.4 GHz	min. 60 W (47.8 dBm)
	\geq 2.4 GHz	min. 55 W (47.4 dBm)
Nominal power gain		51.2 dB
Gain flatness		± 2.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 60 W, < 1.8 GHz	< -18 dBc
	at 60 W, \geq 1.8 GHz	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 52.5 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 10.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 13 kg (29 lb)

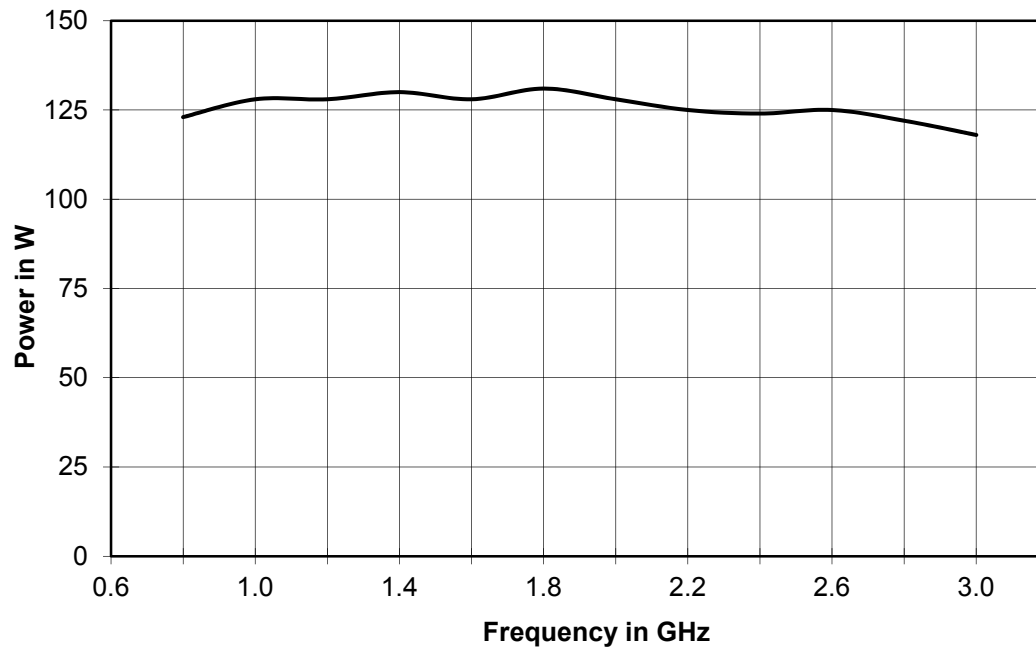
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	5.2 A
	at 230 V	2.5 A
Rated power	RF _{cw} = 60 W (eff.), VSWR = 1	570 VA

Power class 110 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		0.8 GHz to 3.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		110 W (50.4 dBm)
Output power		min. 120 W (50.8 dBm)
Power output at 1 dB compression		min. 110 W (50.4 dBm)
Nominal power gain		53.8 dB
Gain flatness		± 2.7 dB
Gain adjustment range		> 15 dB
Harmonics	at 110 W, < 1.8 GHz	< -18 dBc
	at 110 W, ≥ 1.8 GHz	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 55.5 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 10.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 17 kg (37 lb)

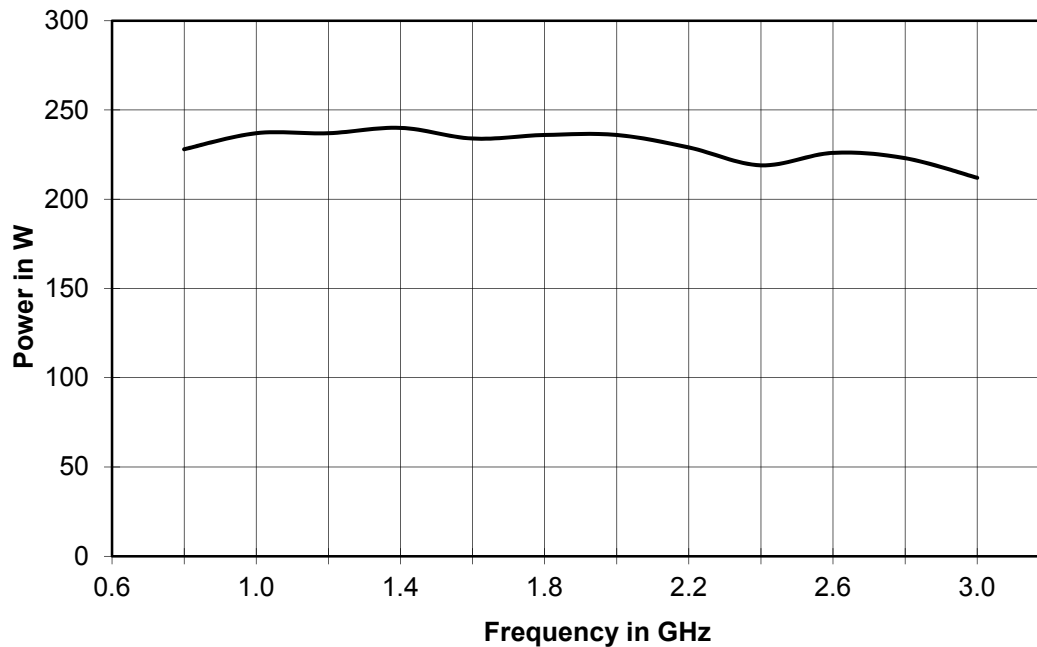
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	10.5 A
	at 230 V	5.0 A
Rated power	RF _{cw} = 110 W (eff.), VSWR = 1	1.15 kVA

Power class 200 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		0.8 GHz to 3.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		200 W (53.0 dBm)
Output power		min. 220 W (53.4 dBm)
Power output at 1 dB compression		min. 200 W (53.0 dBm)
Nominal power gain		56.4 dB
Gain flatness		± 2.7 dB
Gain adjustment range		> 15 dB
Harmonics	at 200 W, < 1.8 GHz	< -17 dBc
	at 200 W, ≥ 1.8 GHz	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 59.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 10.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight	base unit	approx. 24 kg (53 lb)

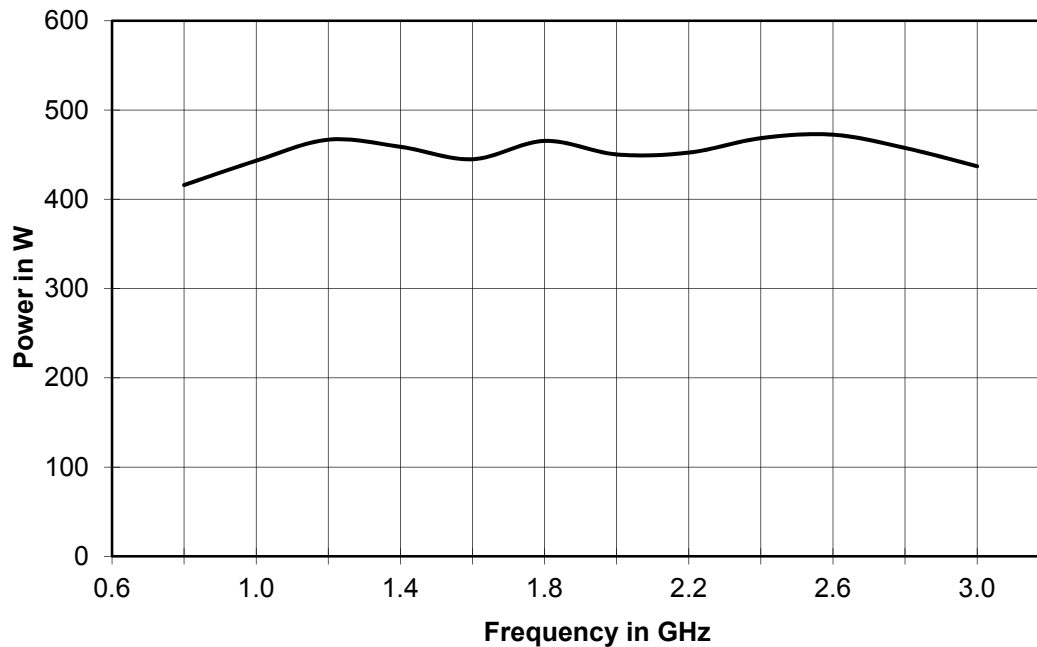
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	18.2 A
	at 230 V	8.7 A
Rated power	RF _{cw} = 200 W (eff.), VSWR = 1	2.0 kVA

Power class 400 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		0.8 GHz to 3.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		400 W (56.0 dBm)
Output power		min. 420 W (56.2 dBm)
Power output at 1 dB compression		min. 400 W (56.0 dBm)
Nominal power gain		59.4 dB
Gain flatness		± 2.7 dB
Gain adjustment range		> 15 dB
Harmonics	at 400 W, < 1.8 GHz	< -18 dBc
	at 400 W, ≥ 1.8 GHz	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 61.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 12.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 50 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	rack setup	19" rack, 12 HU, depth 800 mm (31.5 in)
Weight		approx. 95 kg (209 lb)

RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	7/16 DIN female
	or rear panel	7/16 DIN female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

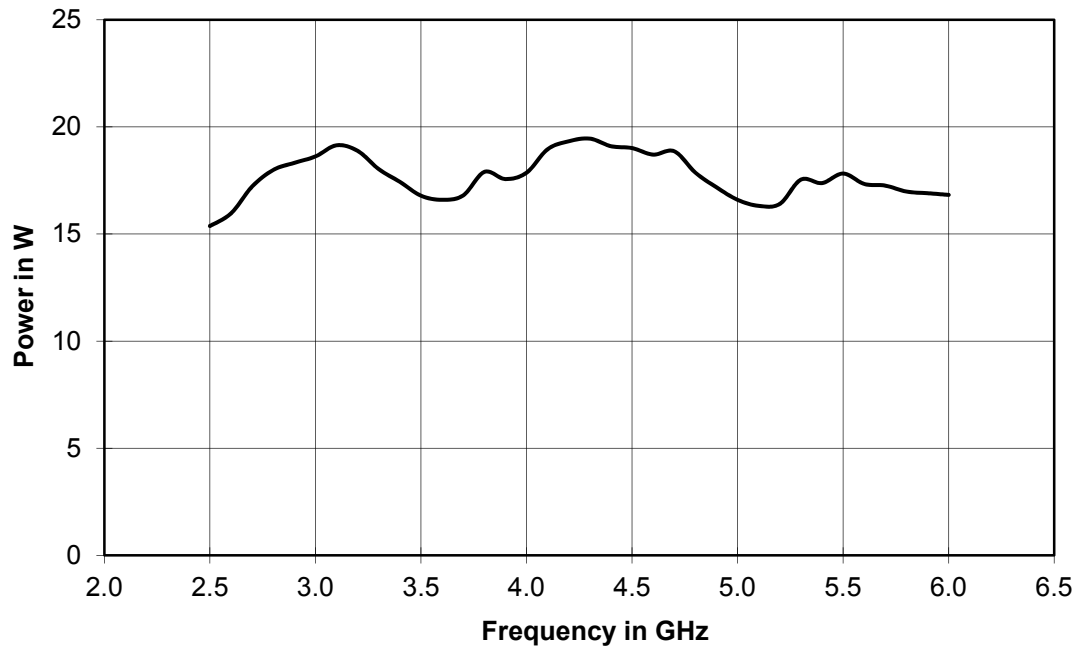
Electrical specifications

AC supply voltage		
Nominal operating voltage range	standard	380 to 415 V AC \pm 10 %, three phase with N, 50 Hz to 60 Hz \pm 6 %
	on request	208 V to 240 V AC \pm 10 %, three phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 230 V per phase	7.8 A/7.8 A/0.1 A
Rated power	RF _{OW} = 400 W (eff.), VSWR = 1	3.6 kVA

Frequency band from 2.5 GHz to 6.0 GHz

Power class 15 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		2.5 GHz to 6.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		15 W (41.8 dBm)
Output power		min. 18 W (42.6 dBm)
Power output at 1 dB compression		min. 15 W (41.8 dBm)
Nominal power gain		45.2 dB
Gain flatness		± 2.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 15 W	< -23 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 48.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 11.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 11 kg (24 lb)

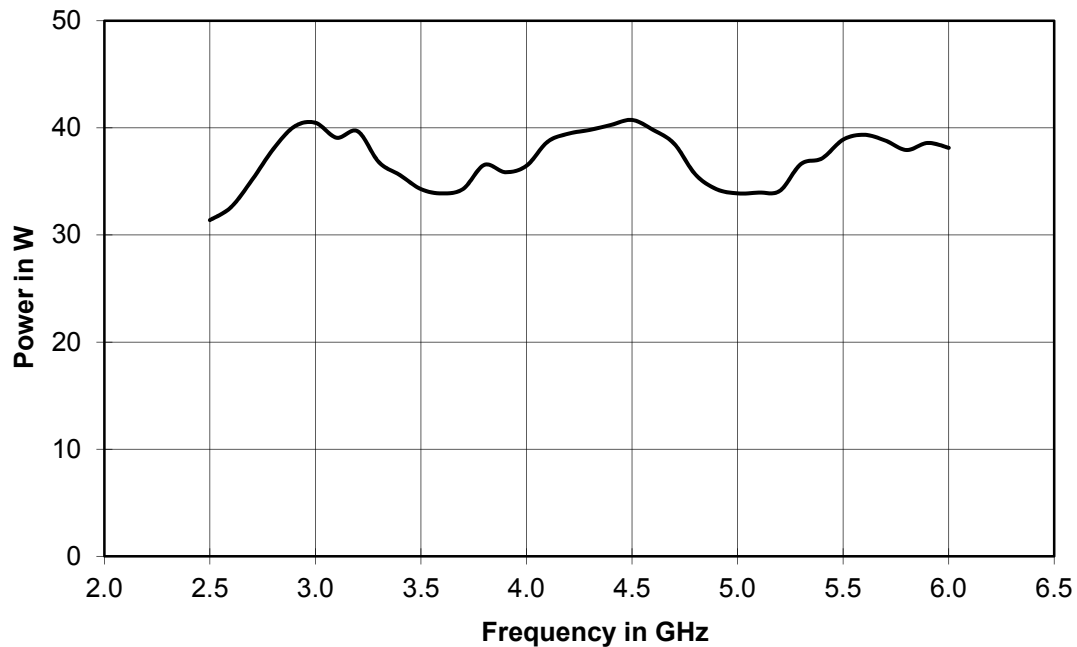
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	4.5 A
	at 230 V	2.2 A
Rated power	RF _{cw} = 15 W (eff.), VSWR = 1	500 VA

Power class 30 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		2.5 GHz to 6.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		30 W (44.8 dBm)
Output power		min. 35 W (45.4 dBm)
Power output at 1 dB compression		min. 30 W (44.8 dBm)
Nominal power gain		48.2 dB
Gain flatness		± 2.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 30 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 50.5 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 11.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 11 kg (24 lb)

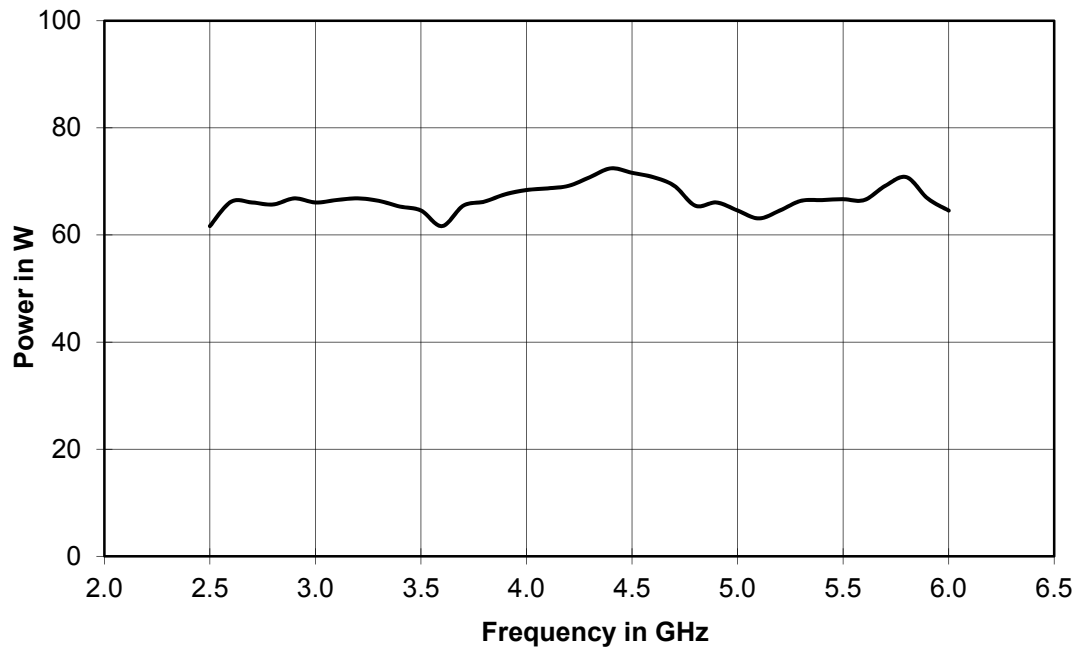
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	4.5 A
	at 230 V	2.2 A
Rated power	RF _{cw} = 30 W (eff.), VSWR = 1	500 VA

Power class 60 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		2.5 GHz to 6.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		60 W (47.8 dBm)
Output power		min. 65 W (48.1 dBm)
Power output at 1 dB compression	< 3.8 GHz	min. 57 W (47.6 dBm)
	≥ 3.8 GHz	min. 60 W (47.8 dBm)
Nominal power gain		51.2 dB
Gain flatness		± 3.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 60 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 53.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 11.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 15 kg (33 lb)

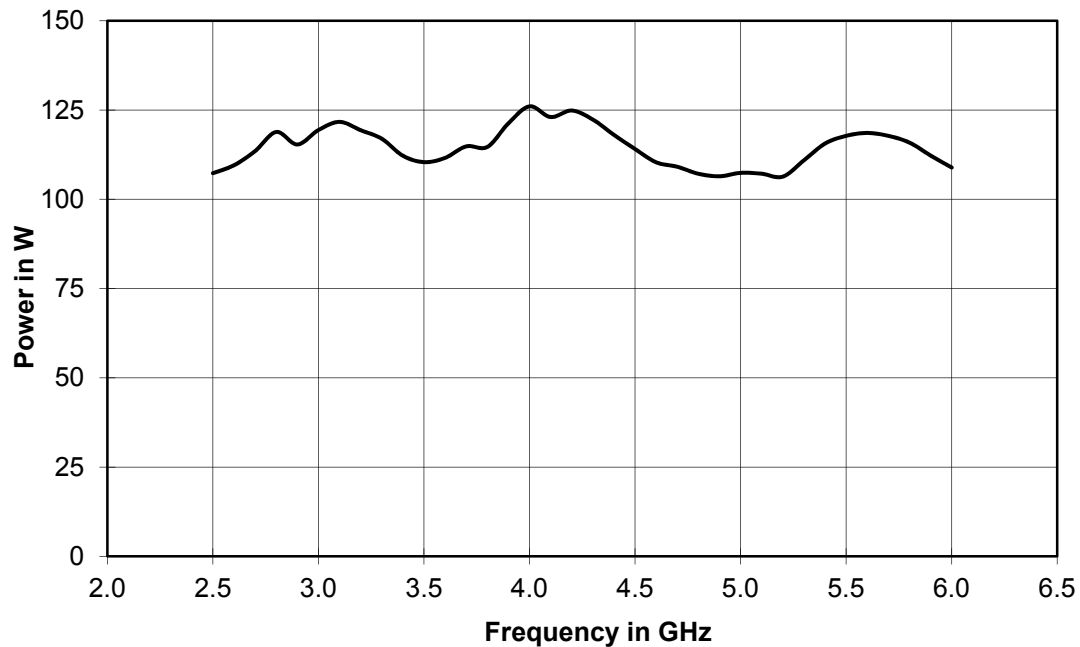
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	6.9 A
	at 230 V	3.3 A
Rated power	RF _{cw} = 60 W (eff.), VSWR = 1	760 VA

Power class 100 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		2.5 GHz to 6.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		100 W (50.0 dBm)
Output power		min. 110 W (50.4 dBm)
Power output at 1 dB compression		min. 100 W (50.0 dBm)
Nominal power gain		53.4 dB
Gain flatness		± 3.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 100 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 55.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 11.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 17 kg (37 lb)

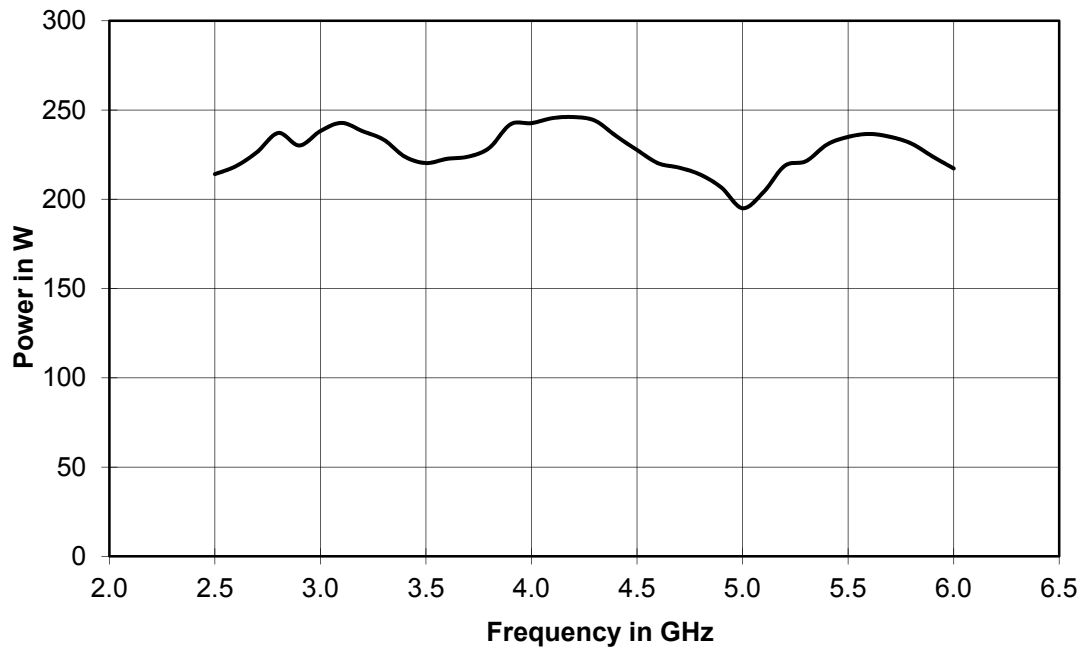
RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	10.0 A
	at 230 V	4.8 A
Rated power	RF _{cw} = 100 W (eff.), VSWR = 1	1.1 kVA

Power class 200 W

Frequency response at 1 dB compression



RF specifications

Main parameters		
Frequency range		2.5 GHz to 6.0 GHz instantaneously
Nominal output load		50 Ω
Nominal output power		200 W (53.0 dBm)
Output power		min. 200 W (53.0 dBm)
Power output at 1 dB compression	entire band except 4.7 GHz to 5.2 GHz	min. 200 W (53.0 dBm)
	4.7 GHz to 5.2 GHz	min. 180 W (52.6 dBm)
Nominal power gain		56.4 dB
Gain flatness		± 3.0 dB
Gain adjustment range		> 15 dB
Harmonics	at 200 W	< -20 dBc
Third-order intercept point (TOI)	test frequencies 1 MHz apart	min. 58.0 dBm
Spurious	carrier offset > 100 kHz	< -80 dBc
Noise figure	at maximum gain	nom. < 11.0 dB

Input		
Nominal input impedance		50 Ω
Input level for nominal output power		-3.4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF	+15 dBm
	DC	0 V

Output		
Nominal output impedance		50 Ω
Nominal forward output power	at VSWR < 6:1	without foldback
Output mismatch protection, VSWR		100 %, without damage

RF sample and detected sample signals		
RF sample signal coupling factor	RF forward and reflected sample ports, optional	approx. 46 dB, see test report for details
Detected sample signal level	detected forward and reflected sample ports, optional	0.8 V to 2.6 V DC

Mechanical specifications

System size		
Dimensions	W × H × D, incl. fans, handles and stand	430 mm × 196 mm × 580 mm (16.93 in × 7.72 in × 22.83 in)
	for rackmounting	19" 1/1, 4 HU
Weight		approx. 24 kg (53 lb)

RF and sample connectors		
RF input port	either front panel	N female
	or rear panel	N female
RF output port	either front panel	N female
	or rear panel	N female
RF sample port	forward output power, optional	N female
	reflected output power, optional	N female
Detected sample port	forward output power, optional	N female
	reflected output power, optional	N female

Electrical specifications

AC supply voltage		
Nominal operating voltage range		100 V to 240 V AC \pm 10 %, single phase 50 Hz to 60 Hz \pm 6 %
Rated current	at 110 V	19.0 A
	at 230 V	9.1 A
Rated power	RF _{cw} = 200 W (eff.), VSWR = 1	2.1 kVA

General data

Modulation specifications

Modulation capability		AM, FM, ϕ M or PM
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Cooling specifications

Air cooling		forced air, built-in fans, air entry at front, air exit at rear
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Control specifications

Remote control		
Ethernet		RJ-45, 10/100 Mbit/s, auto-negotiation, half/full duplex

Local HMI		
Local display		200 × 48 pixel, monochrome
Manual controls	resting pushbutton	mains switch
	operation pushbuttons	<ul style="list-style-type: none"> • system standby/on • RF standby/operate • local/remote
	menu pushbuttons	<ul style="list-style-type: none"> • arrow up, down, left, right • ok • back
LED status information		<ul style="list-style-type: none"> • system standby/on • RF standby/operate • mute ready • interlock • error • local/remote

Web GUI		
Remote web GUI	via Ethernet	RJ-45, 10/100 Mbit/s, auto-negotiation, half/full duplex

Environmental specifications

Temperature loading	operating temperature range	0 °C to +40 °C
	storage temperature range	–20 °C to +70 °C
Damp heat		max. +40 °C at 95 % rel. humidity, without condensation
Altitude	operating altitude	up to 2000 m
	storage altitude	up to 4600 m
Mechanical resistance test values of desktop models	vibration, sinusoidal	5 Hz to 55 Hz, displacement 0.15 mm, > 55 Hz to 150 Hz, acceleration 0.5 g, in line with EN 60068-2-6
	vibration, random	effective acceleration ≤ 1.2 g, 10 Hz to 300 Hz, acceleration density $0.003 \text{ g}^2/\text{Hz}$, in line with EN 60068-2-64
	shock	18 sawtooth shocks, each 40 g in 11 ms, in line with EN 60068-2-27, MIL-STD-810E method no. 516.4, procedure I
Calibration interval		no calibration needed
Electromagnetic compatibility	immunity	in line with EN 61326-1, public and industrial area
	electromagnetic fields	$\leq 10 \text{ V/m}$, in line with IEC 61000-4-3
	surge test: line to ground	$\leq 2 \text{ kV}$, in line with IEC 61000-4-5
	surge test: interlock to ground	$\leq 2 \text{ kV}$, in line with IEC 61000-4-5
	surge test: Ethernet to ground	$\leq 2 \text{ kV}$, in line with IEC 61000-4-5
	surge test: RF output to ground	$\leq 2 \text{ kV}$, in line with IEC 61000-4-5
	surge test: line to line	$\leq 1 \text{ kV}$, in line with IEC 61000-4-5
Electromagnetic emissions	bursts	$\leq 2 \text{ kV}$, in line with IEC 61000-4-4
	overall	in line with EN 55011 (CISPR 11), industrial area, ISM group 1 or 2 and FCC 047 CFR part 18, non-consumer equipment
	conducted emissions	in line with EN 55011, class A
	radiated emissions from 30 MHz to 18 GHz	equipment for use in shielded areas only, normative limits of EN 55011 group 1/2 class A or FCC 047 CFR part 18 exceeded up to 40 dB and by R&S®BBA150-D400 and R&S®BBA150-E200 up to 50 dB
Electromagnetic field strength	all-around the enclosure	in line with the limits of rec 1999/519/EC, 26. BImSchV, BGV B11 exposure limit 2 (protection of health and safety of workers, consumers and the general public)
Electrical safety		in line with EN 61010-1:2010, IEC 61010-1:2011 + Corr. 2011 (3rd ed.), CAN/CSA-C22.2 no. 61010-1-12, UL 61010-1 3rd edition, May 11, 2012

Protection

RF		
Load VSWR		unlimited
Interlock		1 device interlock, 1 configurable interlock
Input protection against bias voltage	optional	DC block level $\leq 50 \text{ V DC}$

Power supply		
Transient voltage compatibility		category II, in line with IEC 60364-4-443
Short-circuit breaking capacity		automatic all-pole 20 A circuit breaker

Miscellaneous		
Thermal overload		shutdown at thermal overload

RF switching specifications – input and measurement

RF input switch, R&S® BBA-B110 option		
Switch type		1:2 or 2:1, mechanical
RF input port		N female
Frequency range		0 Hz to 8 GHz
Switching time		< 10 ms
Life		10 000 000 cycles
Insertion loss	0 Hz to 3 GHz	≤ 0.20 dB, without cable loss
	3 GHz to 8 GHz	≤ 0.30 dB, without cable loss

RF input switch, R&S® BBA-B116 option		
Switch type		1:6, mechanical
RF input port		N female
Frequency range		0 Hz to 8 GHz
Switching time		< 15 ms
Life		5 000 000 cycles
Insertion loss	0 Hz to 3 GHz	≤ 0.20 dB, without cable loss
	3 GHz to 8 GHz	≤ 0.30 dB, without cable loss

RF sample port switch, dual port, R&S® BBA-B142 option		
Switch type		2 × 2:1, mechanical
RF or detected sample port	forward output power	N female
	reflected output power	N female
Frequency range		0 Hz to 8 GHz
Switching time		< 10 ms
Life		10 000 000 cycles
RF sample signal level		max. 10 dBm
Insertion loss	0 Hz to 3 GHz	≤ 0.20 dB, without cable loss
	3 GHz to 8 GHz	≤ 0.30 dB, without cable loss

RF sample port switch, dual port, R&S® BBA-B146 option		
Switch type		2 × 6:1, mechanical
RF or detected sample port	forward output power	N female
	reflected output power	N female
Frequency range		0 Hz to 8 GHz
Switching time		< 10 ms
Life		5 000 000 cycles
RF sample signal level		max. 10 dBm
Insertion loss	0 Hz to 3 GHz	≤ 0.20 dB, without cable loss
	3 GHz to 8 GHz	≤ 0.30 dB, without cable loss

RF switching specifications – output

RF output switch, R&S® BBA-B120 option		
Switch type		2:1 or 1:2, mechanical
RF output port		N female
Frequency range		0 Hz to 8 GHz
Switching time		< 15 ms
Life		1 000 000 cycles
Average forward RF power	0 Hz to 1 GHz	max. $700 \text{ W} \cdot 1/\sqrt{\text{VSWR}}$
	1 GHz to 2 GHz	max. $500 \text{ W} \cdot 1/\sqrt{\text{VSWR}}$
	2 GHz to 3 GHz	max. $400 \text{ W} \cdot 1/\sqrt{\text{VSWR}}$
	3 GHz to 8 GHz	max. $250 \text{ W} \cdot 1/\sqrt{\text{VSWR}}$
Insertion loss	0 Hz to 1 GHz	≤ 0.15 dB, without cable loss
	1 GHz to 2 GHz	≤ 0.20 dB, without cable loss
	2 GHz to 3 GHz	≤ 0.25 dB, without cable loss
	3 GHz to 8 GHz	≤ 0.35 dB, without cable loss

RF output switch, R&S® BBA-B121 option		
Switch type		2:2, mechanical
RF output port		7/16 female
Frequency range		0 Hz to 6 GHz
Switching time		< 100 ms

Life		$\geq 500\,000$
Average forward RF power	0 Hz to 0.1 GHz	max. $5\text{ kW} \cdot 1/\sqrt{\text{VSWR}}$
	0.1 GHz to 0.23 GHz	max. $3.5\text{ kW} \cdot 1/\sqrt{\text{VSWR}}$
	0.23 GHz to 0.86 GHz	max. $2\text{ kW} \cdot 1/\sqrt{\text{VSWR}}$
	0.86 GHz to 3 GHz	max. $1.2\text{ kW} \cdot 1/\sqrt{\text{VSWR}}$
	3 GHz to 6 GHz	max. $0.8\text{ kW} \cdot 1/\sqrt{\text{VSWR}}$
Insertion loss	0 Hz to 0.1 GHz	$\leq 0.01\text{ dB}$, without cable loss
	0.1 GHz to 0.23 GHz	$\leq 0.01\text{ dB}$, without cable loss
	0.23 GHz to 0.86 GHz	$\leq 0.01\text{ dB}$, without cable loss
	0.86 GHz to 3 GHz	$\leq 0.05\text{ dB}$, without cable loss
	3 GHz to 6 GHz	$\leq 0.1\text{ dB}$, without cable loss

RF output switch, R&S® BBA-B126 option		
Switch type		6:1, mechanical
RF output port		N female
Frequency range		0 Hz to 8 GHz
Switching time		< 15 ms
Life		$\geq 2\,000\,000$ cycles
Average forward RF power	0 Hz to 1 GHz	max. $700\text{ W} \cdot 1/\sqrt{\text{VSWR}}$
	1 GHz to 2 GHz	max. $500\text{ W} \cdot 1/\sqrt{\text{VSWR}}$
	2 GHz to 3 GHz	max. $400\text{ W} \cdot 1/\sqrt{\text{VSWR}}$
	3 GHz to 8 GHz	max. $250\text{ W} \cdot 1/\sqrt{\text{VSWR}}$
Insertion loss	0 Hz to 1 GHz	$\leq 0.15\text{ dB}$, without cable loss
	1 GHz to 2 GHz	$\leq 0.20\text{ dB}$, without cable loss
	2 GHz to 3 GHz	$\leq 0.25\text{ dB}$, without cable loss
	3 GHz to 8 GHz	$\leq 0.35\text{ dB}$, without cable loss

Rohde & Schwarz assures nominal output power of each frequency band at the amplifier's output. Usage of one or more RF output switches may reduce the achievable output power due to insertion loss and cable loss.

Fast amplifier mute specifications

Fast amplifier mute, R&S® BBA-B130 option		
External mute signal		TTL
Mute on delay (amplifier switches to mute mode, RF turns off)		nom. < 8 μs
Mute off delay (amplifier leaves mute mode, RF turns on)		nom. < 4 μs
Noise level during mute		-168 dBm (1 Hz)

Ordering information

R&S® BBA150 single-band power amplifiers

Frequency band from 9 kHz to 250 MHz

Designation	Type	Configuration No.
125 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-A125
160 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-A160
200 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-A200
2500 W, air-cooled, 35 HU rack model	R&S® BBA150	BBA150-A2500

Frequency band from 80 MHz to 1.0 GHz

Designation	Type	Configuration No.
70 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-BC70
125 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-BC125
250 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-BC250
500 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-BC500
1000 W, air-cooled, 12 HU rack model	R&S® BBA150	BBA150-BC1000
1500 W, air-cooled, 20 HU rack model	R&S® BBA150	BBA150-BC1500

Frequency band from 0.8 GHz to 3.0 GHz

Designation	Type	Configuration No.
30 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-D30
60 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-D60
110 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-D110
200 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-D200
400 W, air-cooled, 12 HU rack model	R&S® BBA150	BBA150-D400

Frequency band from 2.5 GHz to 6.0 GHz

Designation	Type	Configuration No.
15 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-E15
30 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-E30
60 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-E60
100 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-E100
200 W, air-cooled, 4 HU desktop model	R&S® BBA150	BBA150-E200

Accessories supplied: power cord, user manual on CD.

R&S® BBA150 dual-band power amplifiers

Frequency bands from 0.8 GHz to 3.0 GHz and 2.5 GHz to 6.0 GHz

Designation	Type	Configuration No.
30 W/15 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D30E15
30 W/30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D30E30
60 W/15 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60E15
60 W/30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60E30
60 W/60 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D60E60
110 W/30 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110E30
110 W/60 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110E60
110 W/100 W, air-cooled, 4 HU desktop model	R&S®BBA150	BBA150-D110E100
200 W/60 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D200E60
200 W/100 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D200E100
200 W/200 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D200E200
400 W/60 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D400E60
400 W/100 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D400E100
400 W/200 W, air-cooled, 12 HU rack model	R&S®BBA150	BBA150-D400E200

Accessories supplied: power cord, user manual on CD.

Options

Designation	Type	Order No.
GPIO Remote Control (external add-on)	R&S®BBA-B101	5355.8189.00
RF Input Switch (1:2 or 2:1, N)	R&S®BBA-B110	5355.8866.02 ¹
RF Input Switch (1:6, N)	R&S®BBA-B116	5355.8950.02
RF Output Switch (2:1 or 1:2, N)	R&S®BBA-B120	5355.8795.02 ¹
RF Output Switch (2:2, 7/16)	R&S®BBA-B121	5355.8895.02 ¹
RF Output Switch (6:1, N)	R&S®BBA-B126	5355.8995.02
Fast Amplifier Mute	R&S®BBA-B130	5355.8114.02
DC Block Input Protection (N)	R&S®BBA-B132	5353.9236.03
RF Forward/RF Reflected Sample Ports (N front)	R&S®BBA-B140	5355.8837.02
RF Forward/RF Reflected Sample Ports (N rear)	R&S®BBA-B140	5355.8837.03
Detected Forward/Detected Reflected Sample Ports (N front)	R&S®BBA-B141	5355.8850.02
Detected Forward/Detected Reflected Sample Ports (N rear)	R&S®BBA-B141	5355.8850.03
Sample Port Switch (2 × 2 :1, N)	R&S®BBA-B142	5355.8872.02 ¹
Sample Port Switch (2 × 6:1, N)	R&S®BBA-B146	5355.8972.02
Transparent I/O	R&S®BBA-B160	5355.8889.02

Service

Designation	Type	Order No.
Upgrade Frequency Band/RF Output Power	R&S®BBA-UPGR	on request

Service options		
Extended Warranty, one year	R&S®WE1BBA150	Please contact your local Rohde & Schwarz sales office.
Extended Warranty, two years	R&S®WE2BBA150	
Extended Warranty, three years	R&S®WE3BBA150	
Extended Warranty, four years	R&S®WE4BBA150	

Extended warranty with a term of one to four years (WE1 to WE4)

Repairs carried out during the contract term are free of charge ². Necessary calibration and adjustments carried out during repairs are also covered. Simply contact the forwarding agent we name; your product will be picked up free of charge and returned to you in top condition a couple of days later.

¹ Variant of order number depends on system configuration.

² Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Accessories

Designation	Type	Order No.
Blank Panel Kit, 1 HU	R&S®ZR1-BP01	5353.9559.11
Blank Panel Kit, 2 HU	R&S®ZR1-BP01	5353.9559.12
Blank Panel Kit, 3 HU	R&S®ZR1-BP01	5353.9559.13
Blank Panel Kit, 4 HU	R&S®ZR1-BP01	5353.9559.14
Blank Panel Kit, 5 HU	R&S®ZR1-BP01	5353.9559.15
Rack, 12 HU, depth: 800 mm	R&S®KG-A800	5354.0503.12
Rack, 15 HU, depth: 800 mm	R&S®KG-A800	5354.0503.15
Rack, 20 HU, depth: 800 mm	R&S®KG-A800	5354.0503.20
Rack, 30 HU, depth: 800 mm	R&S®KG-A800	5354.0503.30
Rack, 35 HU, depth: 800 mm	R&S®KG-A800	5354.0503.35
Rack, 42 HU, depth: 800 mm	R&S®KG-A800	5354.0503.42
Rack, 46 HU, depth: 800 mm	R&S®KG-A800	5354.0503.46
Rack Wheels (4 wheels)	R&S®ZR1-RW	5353.9707.03
Rackmounting Brackets (pair)	R&S®ZR1-RA02	5355.8208.00
R&S®BBA150 Mounting Rails, basic model (pair)	R&S®ZR1-SLR03	5355.8220.02
R&S®BBA150 Mounting Rails, without transport safety (pair)	R&S®ZR1-SLR03	5355.8220.03
Standard Mounting Rails (pair)	R&S®ZR1-SLR02	5353.9565.02
AC Power Cord (German plug), PE cable	R&S®ZR1-PSEA	5355.8514.02
AC Power Cord (without plug), PE cable	R&S®ZR1-PSEA	5355.8514.03
AC Power Cord (NEMA L5-15P US plug), PE cable	R&S®ZR1-PSEA	5355.8514.04
AC Power Cord (NEMA L5-30P US plug), PE cable	R&S®ZR1-PSEA	5355.8514.05
AC Power Cord (JIS C8303 Japanese plug), PE cable	R&S®ZR1-PSEA	5355.8514.06
AC Power Cord (PRC3/16 Chinese plug), PE cable	R&S®ZR1-PSEA	5355.8514.07
Operating Manual, German, printed version	R&S®BBA-MA	5355.8120.03
Operating Manual, English, printed version	R&S®BBA-MA	5355.8120.02

For product brochure, see PD 3606.7247.12 and www.rohde-schwarz.com

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The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, radiomonitoring and radiolocation. Founded more than 80 years ago, this independent company has an extensive sales and service network and is present in more than 70 countries. The electronics group is among the world market leaders in its established business fields. The company is headquartered in Munich, Germany. It also has regional headquarters in Singapore and Columbia, Maryland, USA, to manage its operations in these regions.

Sustainable product design

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- ▮ Energy efficiency and low emissions
- ▮ Longevity and optimized total cost of ownership

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ISO 14001

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R&S®BBA150 Broadband Amplifier

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